South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

Final Environmental Impact Statement/ Report, Phase 2

Volume 1 | April 2016

Photo Credit: Cris Benton

U.S. Fish and Wildlife Service / California State Coastal Conservancy

U.S. Fish & Wildlife Service

Coastal Conservancy

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South Bay Salt Pond Restoration Project, Phase 2
FINAL Environmental Impact Statement/Environmental Impact Report (Final EIS/R)

Lead Agencies: U.S. Fish and Wildlife Service (USFWS) and California State Coastal Conservancy (SCC)

Cooperating/Responsible Agencies: California Department of Fish and Wildlife (CDFW), United States Army Corps of Engineers (USACE), Santa Clara Valley Water District (SCVWD), Alameda County Flood Control and Water Conservation District (ACFCWCD), San Francisco Bay Regional Water Quality Control Board (RWQCB), State Lands Commission, San Francisco Bay Conservation and Development Commission (BCDC), City of Mountain View, City of Redwood City, and City of Menlo Park.

Project Abstract: The overall South Bay Salt Pond (SBSP) Restoration Project area is located in South San Francisco Bay in northern California, in the counties of Alameda, Santa Clara, and San Mateo. The overall SBSP Restoration Project area comprises 15,100 acres of salt ponds and adjacent habitats in South San Francisco Bay which USFWS and CDFW (previously California Fish and Game) acquired from Cargill, Inc. in 2003. The overall SBSP Restoration Project is to be implemented in a series of phases over many years. Each phase will have its own project-level National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) document.

This project-level Phase 2 Final EIS/R tiers from the 2007 EIS/R, which was both a program-level EIS/R and a Phase 1 project-level EIS/R. It considers activities occurring within the USFWS-managed Don Edwards San Francisco Bay National Wildlife Refuge portion of the overall project area and includes ponds in both the Ravenswood pond complex and the Alviso pond complex. The Final EIS/R evaluates a range of alternatives and their impacts, including a No Action Alternative for each group of ponds. The range of alternatives include varying approaches to restoring tidal marshes (including number and location of breaches and other levee modifications), habitat enhancements (islands, transition zones, and channels), modifications to existing levees and berms to maintain or improve flood protection, and recreation and public access components that correspond to the project objectives. The Final EIS/R also identifies a Preferred Alternative, an Environmentally Superior Alternative, and an Environmentally Preferable Alternative.

Adaptive management is an integral component of the SBSP Restoration Project and allows for lessons learned from earlier phases to be incorporated into subsequent phases as management plans and designs of future actions are updated. This approach to phased tidal restoration acknowledges that uncertainties exist and provides a framework for adjusting management decisions as understanding of the linkages between management actions and the physical and biological response of the system are more fully understood. A key aspect of the adaptive management approach is to avoid adverse environmental impacts by triggering specific preplanned intervention measures if monitoring reveals the ecosystem is evolving (responding to prior interventions) along an undesirable trajectory. Adaptive management is also used to maximize the ability to achieve the Project objectives (benefits). As restoration action progresses, adaptive management would help guide selection of the ultimate mix of habitats. This Final EIS/R does not include actions at CDFW's Eden Landing Ecological Reserve, which is part of the overall SBSP Restoration Project. Proposed Phase 2 projects at Eden Landing will be analyzed in a separate EIS/R anticipated to be released in late 2016.

Final EIS/R Process: This project-level Final EIS/R was prepared in compliance with NEPA and CEQA. This Final EIS/R includes revisions that were made in response to the comments received on the Draft EIS/R during the public review period as well as clarifications and minor corrections that were made by the lead agencies. Formal responses to the comments received on the Draft EIS/R are presented in Appendix R to this Final EIS/R.

The Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] 1503.1) state that after preparing a Final EIS/R, the agency must obtain comments from federal agencies with jurisdiction over the project and request comments from state and local agencies, local tribes, and the public. USFWS will accept and consider comments on the Final EIS/R received within 30 days of publication of the Notice of Availability (NOA) in the Federal Register and will not proceed with implementation of the SBSP Restoration Project during this time period. USFWS expects to publish the NOA in the Federal Register in late June of 2016 and issue a Record of Decision (ROD) in later summer of 2016.

CEQA Guidelines Section 15089(b) states that "lead agencies may provide an opportunity for review of the Final EIR by the public or by commenting agencies before approving the project. The review of a Final EIR should focus on the responses to comments on the Draft EIR." Written responses will be provided to each public agency which commented on the Draft EIS/R at least 10 days prior to certifying the Final EIS/R in accordance with CEQA Guidelines Section 15088(b). It is anticipated that the SCC will issue a Notice of Determination (NOD) in June 2016.

The Final EIS/R is available for public review on the SBSP Restoration Project website (http://www.southbayrestoration.org). Hard copies of the document are also available for public review at the Visitor Center, Don Edwards San Francisco Bay National Wildlife Refuge, 1 Marshlands Road, Fremont, CA 94555, the SCC office at 1330 Broadway, 13th Floor, Oakland, CA 94612, the Corps' San Francisco District offices at 1455 Market Street, San Francisco, CA 94103, SCVWD's administrative offices at 5750 Almaden Expressway, San Jose, CA 95118-3686 and at the following libraries:

- Alviso Branch Library, 5050 N. First St., San Jose, CA 95002.
- Biblioteca Latino America, 921 South First St., San Jose, CA 95110.
- California State University Library, 25800 Carlos Bee Blvd., Hayward, CA 94542.
- Fremont Main Library, 2400 Stevenson Blvd., Fremont, CA 94538.
- Menlo Park Library, 800 Alma St., Menlo Park, CA 94025.
- Mountain View Library, 585 Franklin St., Mountain View, CA 94041.
- Rinconada Library, 1213 Newell Rd., Palo Alto, CA 94303.
- King Library, 150 E San Fernando St., San Jose, CA 95112.
- Redwood City Main Library, 1044 Middlefield Road, Redwood City, CA 94063
- San Mateo County East Palo Alto Library, 2415 University Ave., East Palo Alto, CA 94303.
- Santa Clara County Milpitas Library, 160 N Main St., Milpitas, CA 95035.
- Santa Clara Public Library, 2635 Homestead Rd., Santa Clara, CA 95051.
- Sunnyvale Public Library, 665 W Olive Ave., Sunnyvale, CA 94086.
- Natural Resources Library, U.S. Department of the Interior, 1849 C Street NW, Washington, DC 20240–0001.

Written comments on the Final EIS/R can be submitted to:

- Chris Barr, USFWS, Don Edwards San Francisco Bay NWR, 1 Marshlands Road, Fremont, CA 94555; or
- Brenda Buxton, State Coastal Conservancy, 1330 Broadway, 13th Floor, Oakland, CA 94612

Comments may also be submitted via email to phase2comments@southbayrestoration.org.

EXECUTIVE SUMMARY

S.1 Introduction

This Final Environmental Impact Statement/Environmental Impact Report (EIS/R) was prepared by the United States Fish and Wildlife Service (USFWS) and the California State Coastal Conservancy, partnering with the California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game, CDFG), Santa Clara Valley Water District (SCVWD), the City of Mountain View, the City of Redwood City, and others to evaluate the potential environmental impacts of the proposed South Bay Salt Pond (SBSP) Restoration Project, Phase 2.

S.1.1 SBSP Restoration Phase 2 Project

The SBSP Restoration Project is a multi-agency effort to restore tidal marsh habitat, reconfigure managed pond habitat, maintain or improve flood protection, and provide recreation opportunities and public access in 15,100 acres of former salt-evaporation ponds purchased from and donated by Cargill, Inc. in 2003. Immediately after the March 2003 acquisition, the landowners, CDFW and USWFS, implemented the Initial Stewardship Plan (ISP) (USFWS and CDFG 2003) which was designed to maintain open and unvegetated pond habitats with enough water circulation to prevent salt production and provide some habitat values. The longer-term planning effort, a 50-year programmatic level plan for restoration, flood protection, and public access that included a first phase of projects, is described in the 2007 EIR/S, which addressed the SBSP Restoration Project at both the program level and at the Phase 1 level. This longer-term planning was facilitated by the California State Coastal Conservancy and completed in January of 2009. It was through this planning process that the SBSP Restoration Project created the projects goals and objectives. These goals and objectives continue to guide the project to the present day.

The SBSP Restoration Project's planning phase was completed in January 2009 with the publication of the Final 2007 Programmatic EIS/R. Phase 1 implementation began immediately and was completed in April 2016. It included the construction of 3,040 acres of tidal or muted tidal wetlands, 710 acres of enhanced managed pond, construction of habitat islands and improved levees, 7 miles of new public access and recreation trails, and other public access features. The selection and planning for Phase 2 projects started in 2010, continued with the 2015

SBSP Restoration Project Objectives

1. Create, restore, or enhance habitats of sufficient size, function, and appropriate structure to:
   - Promote restoration of native special-status plants and animals that depend on South San Francisco Bay habitat for all or part of their life cycles.
   - Maintain current migratory bird species that utilize existing salt ponds and associated structures such as levees.
   - Support increased abundance and diversity of native species in various South San Francisco Bay aquatic and terrestrial ecosystem components, including plants, invertebrates, fish, mammals, birds, reptiles and amphibians.
2. Maintain or improve existing levels of flood protection in the South Bay Area.
3. Provide public access and recreational opportunities compatible with wildlife and habitat goals.
4. Protect or improve existing levels of water and sediment quality in the South Bay, and take into account ecological risks caused by restoration.
5. Implement design and management measures to maintain or improve current levels of vector management, control predation on special status species, and manage the spread of nonnative invasive species.
6. Protect the services provided by existing infrastructure (e.g., power lines, railroads).

Draft EIS/R, and proceeds with this Final EIS/R. The ponds that were not part of Phase 1, nor planned to be part of Phase 2, will continue to be actively managed according to the goals set forth in the ISP, an Adaptive Management Plan (AMP), and the 2007 EIS/R until further implementation planning and the appropriate adaptive management studies are completed.

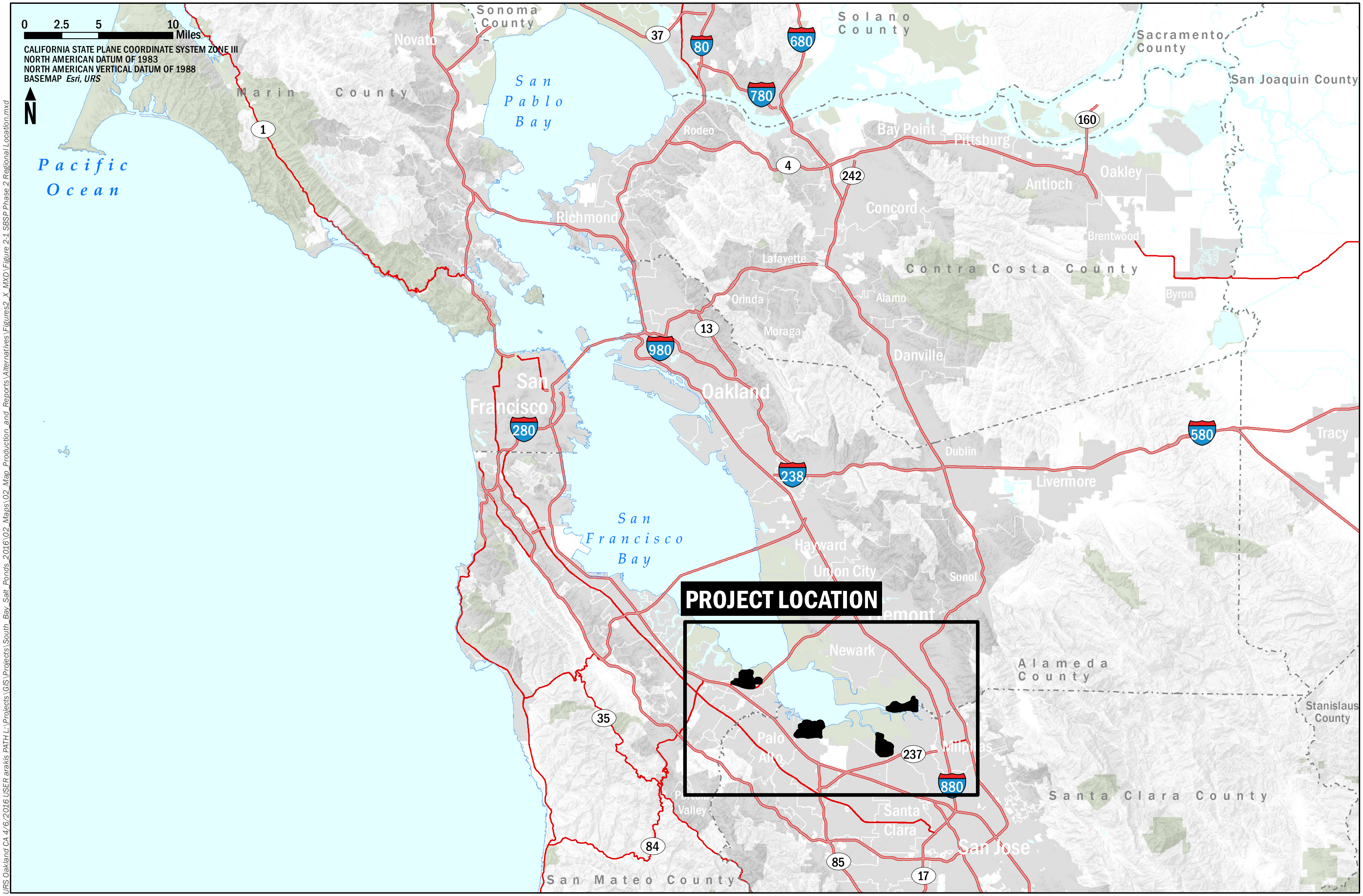
The SBSP Restoration Project is intended to tier from the analysis conducted for the 2007 EIS/R by advancing additional restoration activities within the SBSP project area. The 2007 EIS/R assessed the environmental consequences associated with two long-term restoration alternatives. In consideration of the environmental consequences discussed in the 2007 EIS/R, the USFWS Record of Decision (ROD) and the CDFW Notice of Determination (NOD) state that the USFWS and CDFW will implement Programmatic Alternative C, which would eventually convert up to 90 percent of the former salt ponds to tidal marsh, while at least 10 percent would remain as enhanced managed ponds. Phase 2, as the second project component of this long term restoration project, would incrementally advance the project toward this end goal. Each of the Phase 2 Alternatives considered in this Final EIS/R consist of various components that, if instituted, further advance the project toward achieving the 90/10 goal.

Construction, operations, and maintenance of Phase 2 activities at one pond cluster would be independent from activities at other Phase 2 ponds. When considering and developing project alternatives for Phase 2, each pond cluster has been independently considered in meeting the targeted habitat designated in Program Alternative C (the 90/10 alternative), and separate sets of action alternatives were developed for each pond cluster.

The Phase 2 project would be implemented at the Alviso-Island Ponds, the Alviso-Mountain View Ponds, the Alviso-A8 Ponds, and the Ravenswood Ponds. These pond clusters are located at the Don Edwards National Wildlife Refuge (Refuge) in Alameda, Santa Clara, and San Mateo Counties, California (See Figure ES-1, SBSP Phase 2 Regional Location, and Figure ES-2, SBSP Phase 2 Project Sites). In addition, the Phase 2 projects under consideration include two areas that are not within the Refuge boundary: the City of Mountain View's Charleston Slough and a small portion of land in the City of Menlo Park's Bedwell Bayfront Park. Alternatives are proposed for each pond cluster, including a No Action Alternative. This EIS/R evaluates the following alternatives for each of the pond clusters. It also presents the Phase 2 Preferred Alternative, which combines the selected alternative for each pond cluster with minor modifications where applicable.

Alviso-Island Pond Cluster

The Alviso-Island Ponds cluster (also referred to as the Island Ponds) consists of Ponds A19, A20, and A21, the levees surrounding each pond, and some of the fringe marsh outside of these levees including the narrow marsh between Ponds A19 and A20. Ponds A19, A20, and A21 are located in the eastern portion of the Alviso pond complex. These ponds are oriented east to west between Mud Slough to the north and west and Coyote Creek to the south. Mud Slough and Coyote Creek converge at the western edge of this pond cluster. The community of Alviso and City of Milpitas are located to the south and to the north and east, respectively. The ponds are geographically isolated from any urbanized and built-out areas by other waterbodies, other salt ponds, and a landfill. The former community of Drawbridge is located on a strip of land between Pond A21 and Pond A20. That strip of land also holds an active Union Pacific Railroad (UPRR) track.



URS Oakland CA 4/6/2016 USER arakis PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-1 SBSP Phase 2 Regional Location.mxd

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Figure ES-1
SBSP Phase 2 Regional Location

URS Oakland CA 4/7/2016 USER harmonk PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-2 SBSP Phase 2 Project Sites.mxd

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Figure ES-2
SBSP Phase 2 Project Sites

Under the No Action Alternative for the Alviso-Island Ponds cluster (Alternative Island A), no new activities would occur in Phase 2. Alternative Island B and Island C propose activities that increase habitat complexity and improve the distribution of sedimentation and vegetation establishment of these ponds as they transition to tidal marsh. To increase complexity and connectivity of the Island Ponds and the waterways surrounding them, the activities proposed under these alternatives include breaches of the existing levees at various locations, removal or lowering of levees, and modification of existing breaches. Details about each Phase 2 alternative for this pond cluster are described below.

Due to their geographic isolation, the SBSP Restoration Project does not include recreation or flood control goals for these ponds. Therefore, no flood management or flood control activities or recreation components are proposed at these ponds for Phase 2.

Each Phase 2 alternative at the Island Ponds is described below and illustrated on Figures ES-3 through ES-5. The Phase 2 Action Alternatives for this pond cluster are summarized in Table ES-1.

Alternative Island A (No Action)

Under Alternative Island A (No Action Alternative) no new activities would occur under Phase 2. The pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The existing breached levees would continue to be scoured from hydraulic action and naturally degrade. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be the principal component of the continued implementation of the AMP at this pond cluster.

Ponds A19, A20, and A21 were breached on their southern sides in March 2006 as part of the ISP actions. The intent of the 2006 levee breaches was to bring tidal flows to these ponds and allow sediment to accrete until marsh plain elevation was reached. The unmaintained breaches would continue to scour from hydraulic action until equilibrium with the tidal flux is reached, and most levees would be allowed to degrade naturally. The levee containing the active railroad track would be maintained by UPRR to allow the continued use of the tracks. Under this alternative, this transition to tidal marsh would be allowed to continue. Aside from the monitoring and management activities of the AMP and maintenance of the railroad track, no other operation and maintenance activities would occur.

Table ES-1. Components of the Phase 2 Action Alternatives at the Island Ponds

ALTERNATIVE ISLAND B	ALTERNATIVE ISLAND C
Breach north side of Pond A19 in two places.	Breach north side of Pond A19 in two places.
Lower or remove much of Pond A19’s northern and southern levees.	Lower or remove much of Pond A19’s northern and southern levees.
Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.	Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.
—	Breach the north sides of Ponds A20 and A21.
—	Lower portions of Pond A20’s northern and southern levees.
—	Widen existing breaches on Pond A19’s southern side.
—	Excavate two pilot channels within Pond A19.

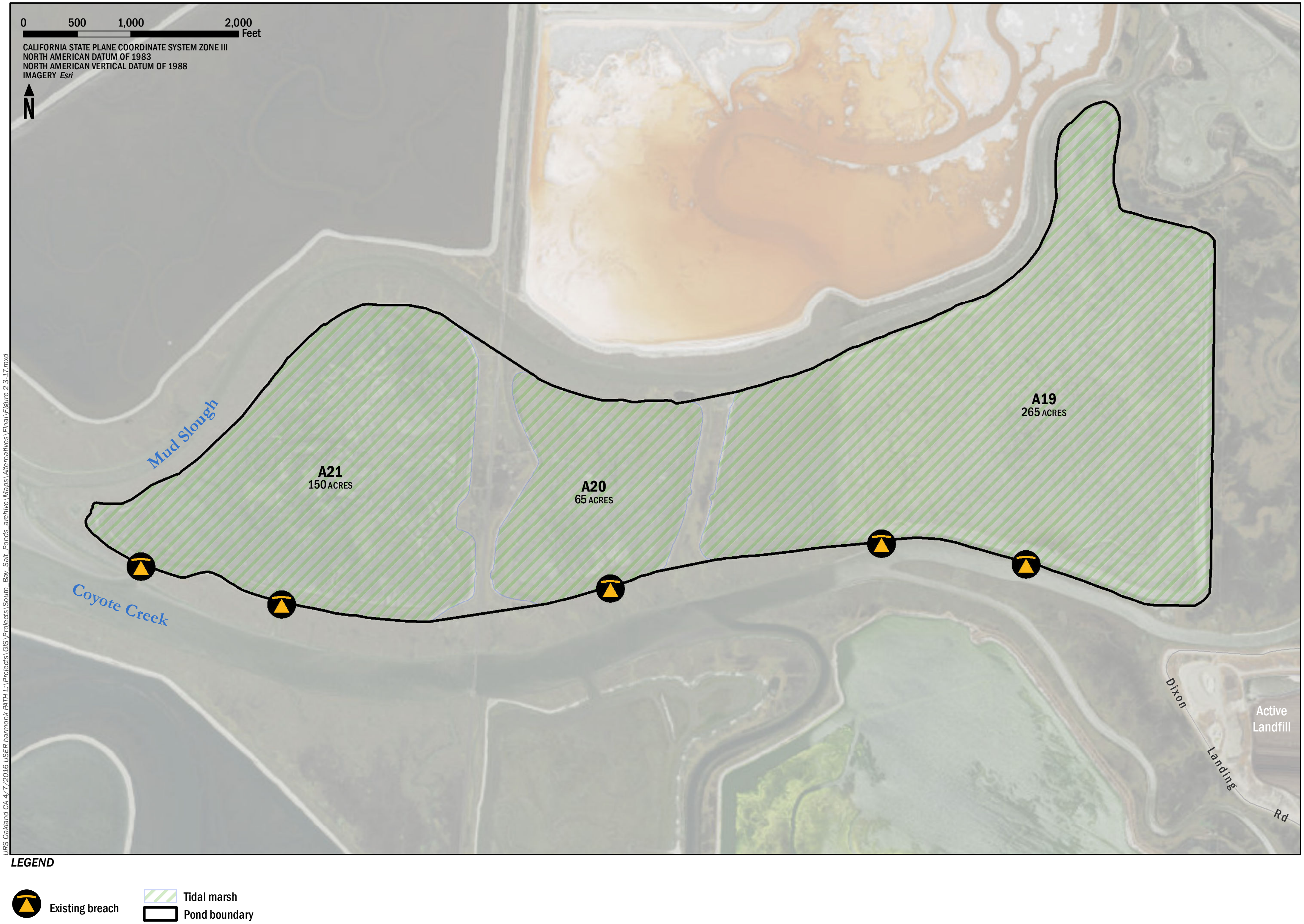

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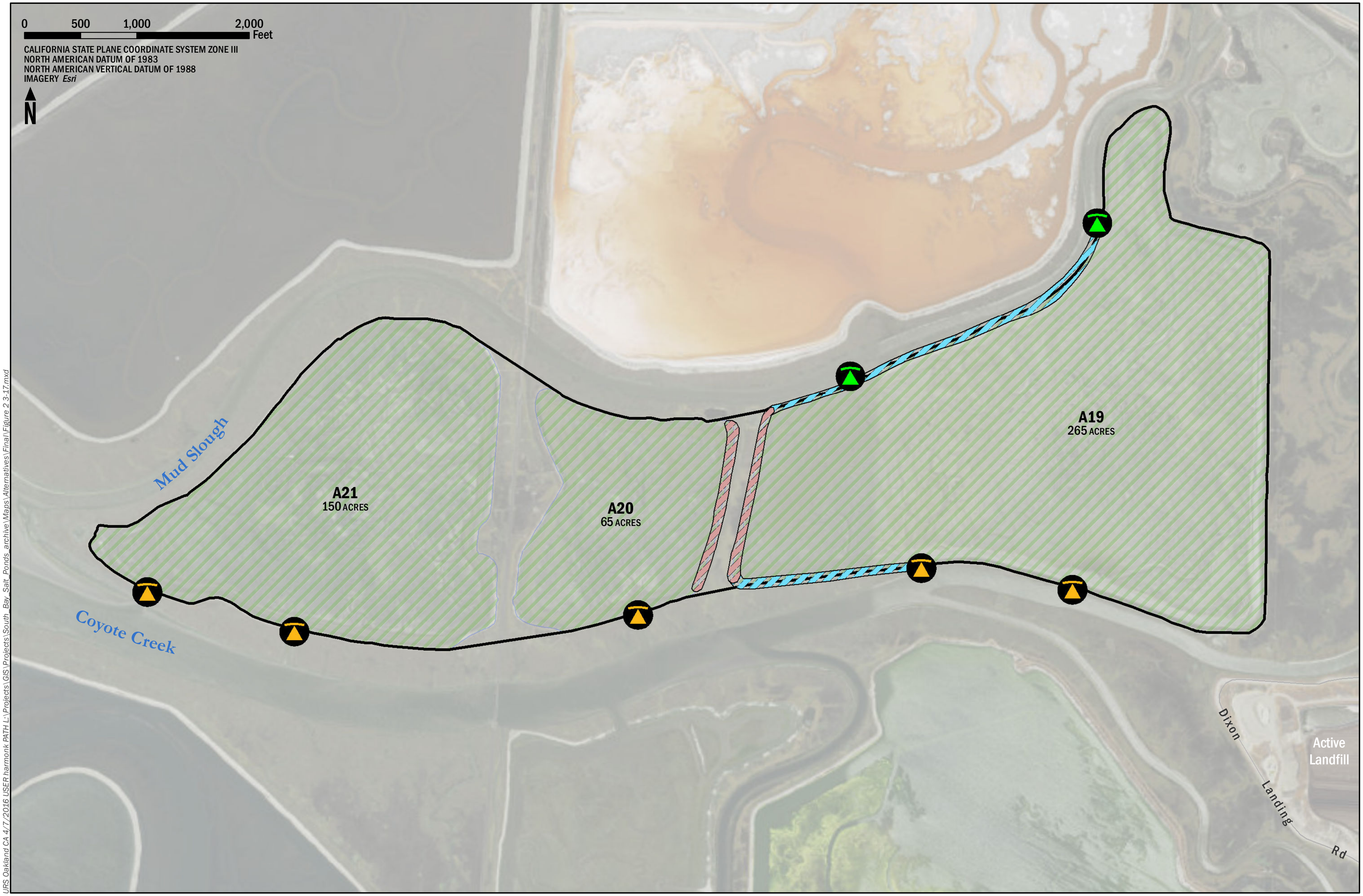
Figure ES-3
Alternative Island A



LEGEND

Proposed breach
Existing breach
Removed levee
Lowered levee
Tidal marsh
Pond boundary

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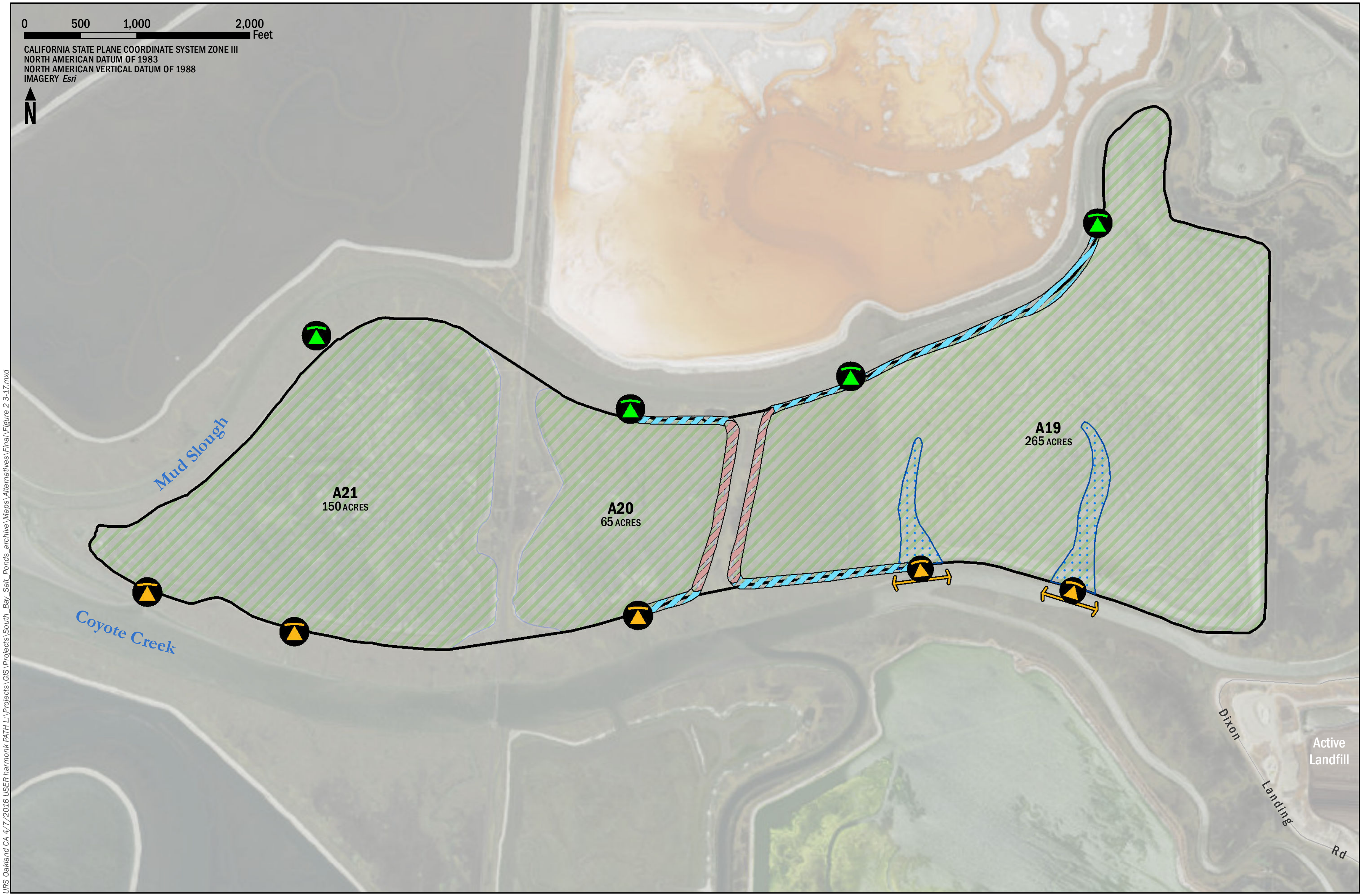
Figure ES-4
Alternative Island B



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LEGEND

Proposed breach

Existing breach

Expand existing breach

Removed levee

Lowered levee

Pilot channel

Tidal marsh

Pond boundary

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Figure ES-5

Alternative Island C

Alternative Island B

Alternative Island B would remove or lower the levees between Ponds A19 and A20 and lower westerly portions of the north and south perimeter levees of Pond A19 to increase connectivity and improve the ecological function of both ponds by altering circulation and sedimentation patterns in the ponds and improve the distribution of sediment accretion in Pond A19 and, to a lesser extent, in Pond A20. Alternative Island B also includes some improvements for habitat quality for juvenile salmonids and other fish. Any levee material moved would be used locally to fill borrow ditches (ditches that were created to construct the original levees) or raise the pond bottom elevation and further speed revegetation.

Alternative Island C

Alternative Island C would include all of the components of Island B with the addition of four components: levee breaches on the north sides of Ponds A20 and A21, lowering of portions of levees around Pond A20, excavating pilot channels in Pond A19, and widening the existing breaches on the southern levee of Pond A19. These additional components are intended to further increase the habitat complexity and connectedness as this pond cluster transitions to tidal marsh. Levee material from lowering would be sidecast into the borrow ditches or pond bottoms to speed the return to marsh plain elevation. These actions would alter circulation and sedimentation patterns in the ponds and improve the distribution of sediment accretion in Pond A19 and to a lesser extent in Ponds A20 and A21.

Similar to Alternative B, improvements would be made for habitat quality for juvenile salmonids and other fish. Under Alternative C, the projected increase in sediment accumulation would help ensure that the rate of sedimentation accretion and marsh development would keep pace with expected SLR. Any levee material moved would be used locally to fill borrow ditches and further speed revegetation.

Operation and Maintenance

Aside from the monitoring and management activities of the AMP and continued maintenance of the existing railroad track, no other operation and maintenance activities would occur at the Island Ponds. The breaches would scour from hydraulic action until equilibrium with the tidal flux is reached, and most levees would be allowed to degrade naturally. The levee containing the existing railroad track would be maintained to allow the continued use of the tracks. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh are a component of the continued implementation of the AMP.

Alviso-Mountain View Pond Cluster

The Alviso-Mountain View pond cluster (the Mountain View Ponds) consists of Pond A1, Pond A2W, the levees surrounding each pond, some of the fringe marsh outside of the pond and slough levees, Permanente Creek, and Mountain View Slough. Charleston Slough, which is owned by the City of Mountain View and is not part of the Refuge, is included as part of the Mountain View pond cluster, as are the levees surrounding it.

The Mountain View Ponds are in the western portion of the Alviso pond complex, between the Palo Alto Flood Basin to the west, Mountain View Shoreline Park and Stevens Creek Marsh to the south, Stevens Creek to the east, and open bay water to the north. The 115-acre Charleston Slough is located at the western end of the cluster. Permanente Creek, which flows into Mountain View Slough, is located between Ponds A1 and A2W. The cities of Mountain View and Palo Alto are located immediately inland of the pond cluster to the south and west, respectively.

Under the No Action Alternative for the Alviso-Mountain View Pond cluster (Mountain View A), no new activities would occur as part of Phase 2. The action alternatives (Mountain View B and Mountain View C) propose activities transitioning the ponds to tidal marsh while maintaining or improving existing flood protection along the pond cluster borders with the cities of Mountain View and Palo Alto. Viewing platforms and trails would be established to improve recreation and public access to the pond cluster. The SBSP Restoration Project goals for this pond cluster are a transition to tidal marsh, maintain or improve flood protection, and improve recreation and public access.

Restoration activities include breaches of levees at various locations, constructing habitat features, and making other levee alterations to improve the overall ecological conditions of Pond A1, Pond A2W, and Charleston Slough. Upland fill material may be used to create habitat transition zones (gently sloping areas), between the bottoms of the ponds and the uplands at the top of the pond levees. Depending on the volume of material available, the constructed slope could be steeper than the planned 30:1 horizontal:vertical ratio, which would reduce the footprint area of the TZH. Upland fill material would also be used to create habitat islands and improve levees

Alternative Mountain View C includes the integration of Charleston Slough into the project, as well as several actions that are necessary to provide additional flood protection to portions of the City of Mountain View and City of Palo Alto and to help maintain the water supply to the sailing lake in Mountain View’s Shoreline Park.

Each Phase 2 alternative at the Mountain View Ponds is described below and illustrated on Figures ES-6 through ES-9. The Phase 2 Action Alternatives for this pond cluster are summarized in Table ES-2.

Alternative Mountain View A (No Action)

Under Alternative Mountain View A, the No Action Alternative, no new activities would be implemented as part of Phase 2. The USFWS would maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System, following the AMP and other management practices. The pond cluster would continue to be managed through activities described in the AMP and in accordance with current USFWS practices. The levees around Ponds A1 and A2W are classified as high priority levees to be maintained for inland flood protection. These outboard levees would be maintained (or repaired upon failure). The ponds would not be actively managed except for the current water quality management in Pond A2W, which involves circulating water as needed to control dissolved oxygen per the existing AMP.

Existing trails on the levees along the boundary of the pond cluster would continue to be maintained. The current use of water from Charleston Slough to supply the Shoreline Park sailing lake would continue. Alternative Mountain View A is shown in Figure ES-6.

The PG&E towers and power lines that run through Pond A2W and outside of it and Pond A1 would continue to be maintained as they are now (see Appendix D to the main text). These maintenance and repair activities include aerial and ground patrol, inspections, equipment inspections, electrical outage repair, and insulator washing and replacement.

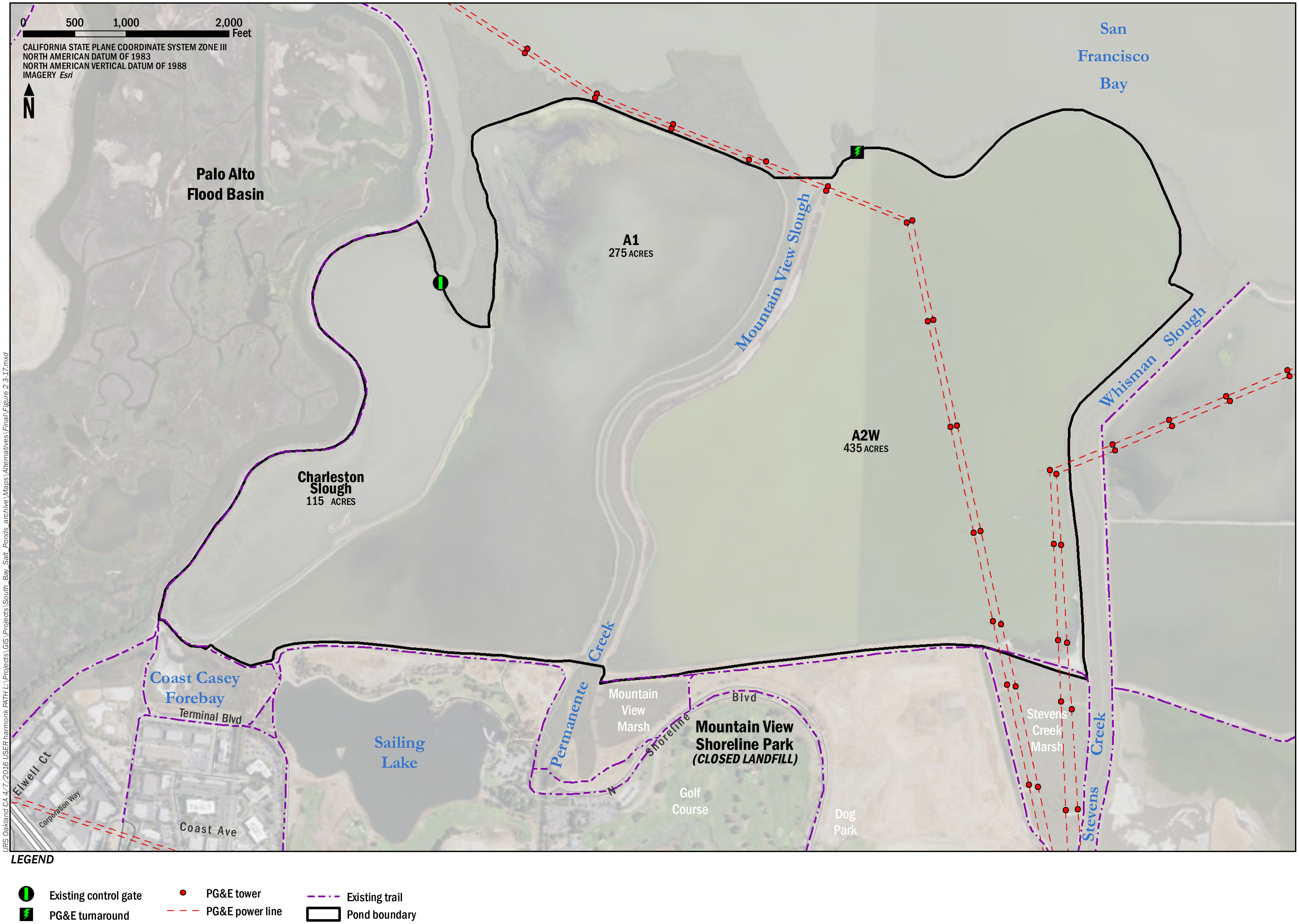

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Figure ES-6

Alternative Mountain View A

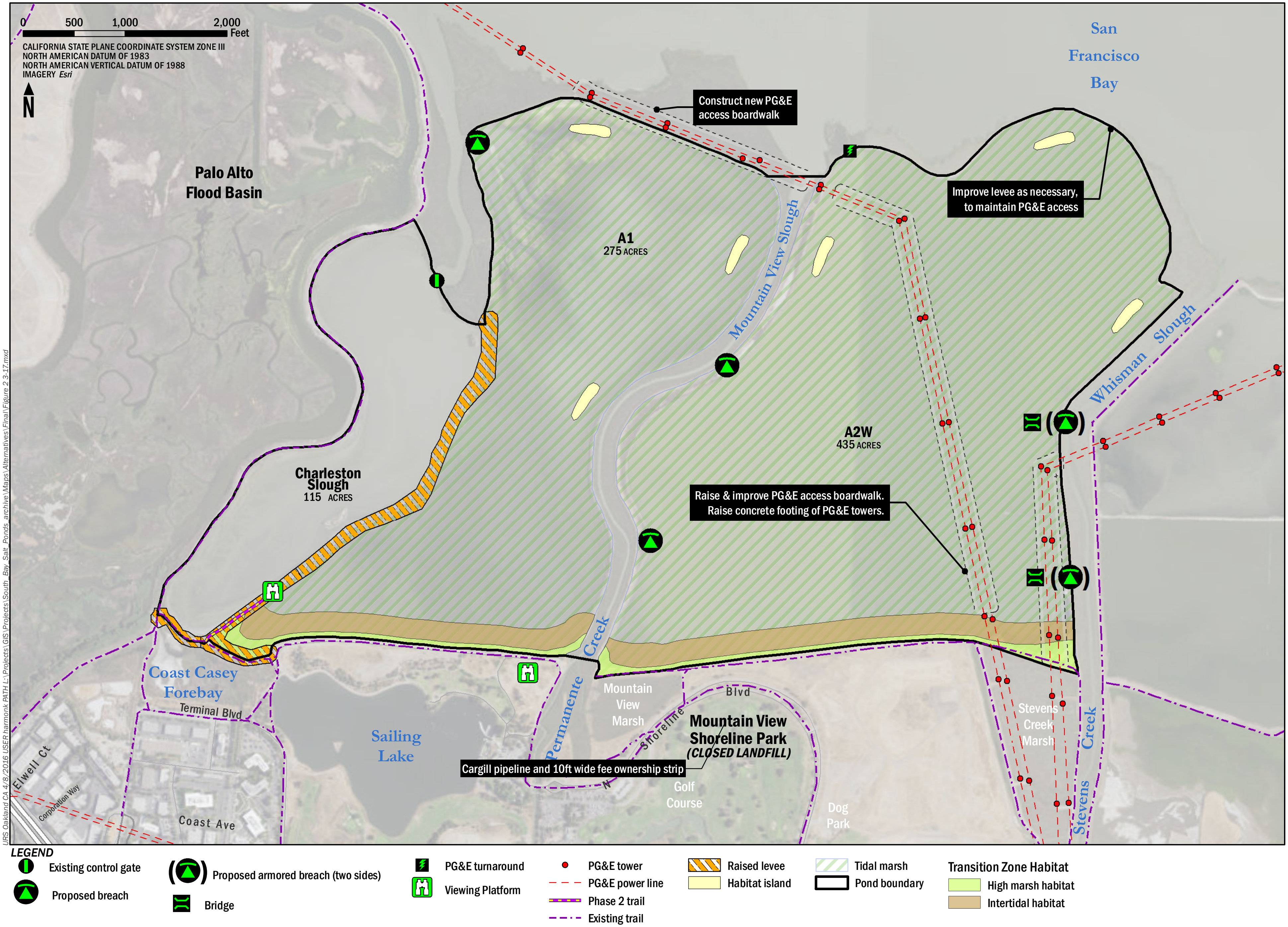

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Figure ES-7
Alternative Mountain View B

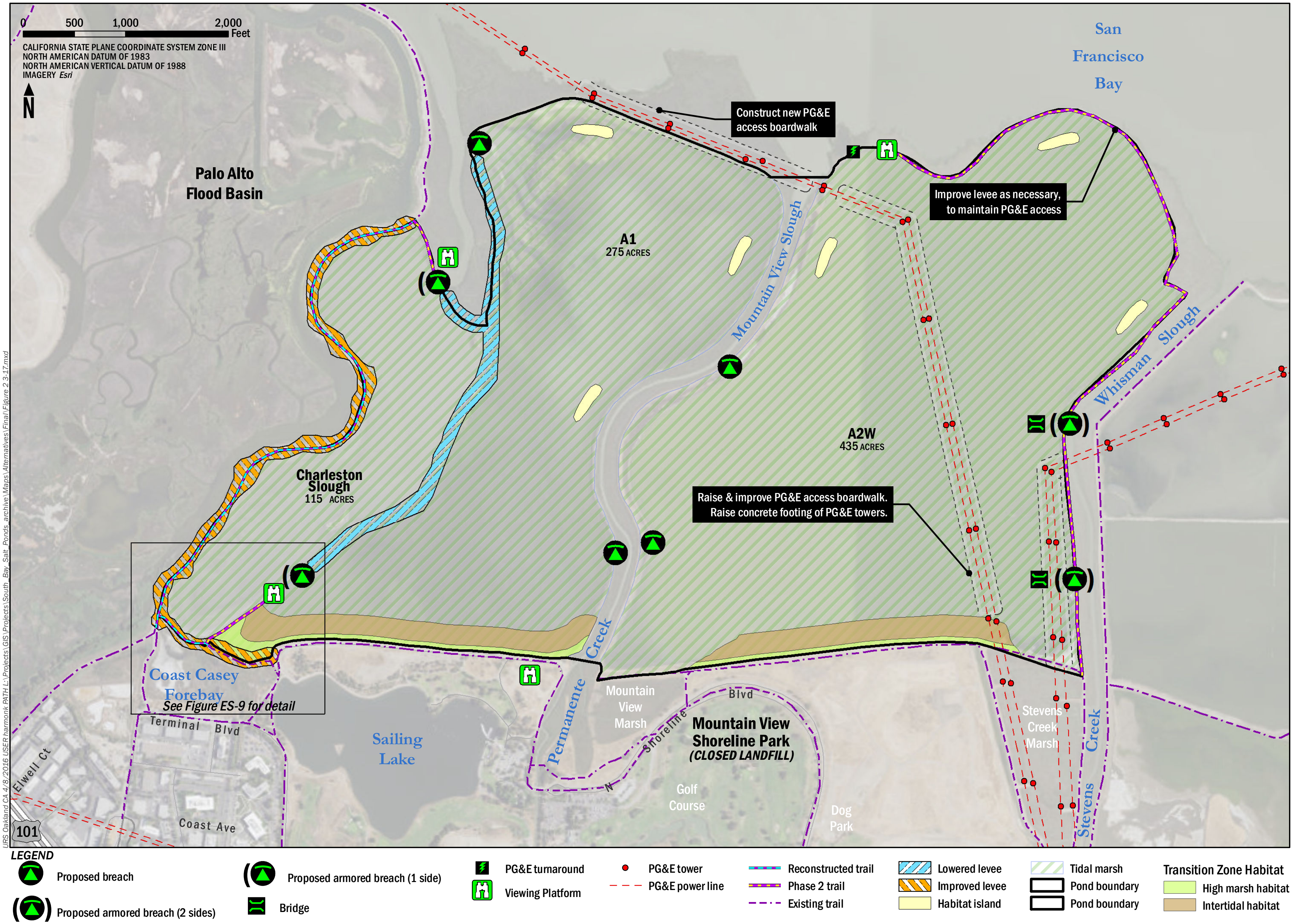

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Figure ES-8
Alternative Mountain View C

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Figure ES-9
Alternative Mountain View C - Detaill

Alternative Mountain View B

Under Alternative Mountain View B, the Pond A1 and A2W levees would be breached at several points to introduce tidal flow in the ponds. Habitat transition zones and islands would be constructed in the ponds to increase habitat complexity and quality for special-status species. A new trail and viewing platform would be installed to improve recreation and public access at these ponds. Onsite cut material from breached or lowered levees and imported upland fill material would be used to raise levees, construct islands, or build transition zones.

Table ES-2. Components of the Phase 2 Action Alternatives at the Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C
Do not include Charleston Slough in tidal marsh restoration.	Include Charleston Slough in tidal marsh restoration.
Raise and improve western levee of Pond A1.	Lower and breach western levee of Pond A1.
Breach the west side of Pond A1 at one location.	Breach Pond A1 at three locations.
—	Breach Charleston Slough and connect it to Pond A1: ▪ Open Charleston Slough to full tidal exchange, by breaching the northern levee or by removing the tide gate structure itself, to allow vegetation to colonize the mud flats surrounding the slough's main channel; ▪ Raise and improve the western levee 1 of Charleston Slough, which separates it from the Palo Alto Flood Basin; ▪ Raise the Coast Casey Forebay levee1 along southern border of Charleston Slough and associated sailing lake water intake and pump station structures; ▪ Add a primary water intake 2 for the Mountain View Shoreline Park sailing lake at the breach in the levee between Charleston Slough and Pond A1; ▪ Lower western levee of Pond A1; ▪ Rebuild the existing viewing platform along the Coast Casey Forebay levee; rebuild the existing trail and replace benches and signage along the improved western levee of Charleston Slough; and ▪ Armor levee on landward side of breach between Pond A1 and Charleston Slough.
Construct bird habitat islands in Ponds A1 and A2W.	Add bird habitat islands in Ponds A1 and A2W.
Construct habitat transition zones across entire southern extent of Ponds A1 and A2W.	Construct a habitat transition zone across entire southern extent of Pond A1 but only across a portion of A2W.
Breach Pond A2W at four locations.	Breach Pond A2W at four locations.
Armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for Pacific Gas and Electric Company (PG&E) access.	Armor the two eastern breaches of Pond A2W and add railcar bridges for PG&E access and recreational trail access.
Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from Pond A2W to connect to existing boardwalk over Bay outside of the Palo Alto Flood Basin.	Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from A2W to connect to existing boardwalk over Bay outside of Palo Alto Flood Basin.

Table ES-2. Components of the Phase 2 Action Alternatives at the Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C
Add viewing platform in Shoreline Park south of Pond A1.	Add viewing platform in Shoreline Park south of Pond A1.
Construct spur trail on improved western levee of Pond A1 to a viewing platform.	Construct spur trail on improved west levee of Pond A1 to a viewing platform at the armored breach.
—	Add a spur trail from Bay Trail spine along Charleston Slough's northern levee to a viewing platform at or near the breach location.
—	Add recreational trail on eastern and northern sides of Pond A2W to a bay side viewing platform near PG&E turnaround point.

[1] The proposed improvements to the Coast Casey Forebay levee and the western levee of Charleston Slough would be to an elevation beyond that required by SBSP Restoration Project's requirements; it would be higher to meet City of Mountain View's expectations for sea-level rise.

[2] The proposed water intake at the A1-Charleston Slough breach location requires the intake, pipes, and sump to be constructed under the existing levee out to the breach.

Alternative Mountain View C

Under Alternative Mountain View C, levees would be breached and lowered to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. The inclusion of Charleston Slough into the SBSP Restoration Project is the primary distinguishing feature between Alternative Mountain View C and Alternative Mountain View B. Other actions would include adding habitat transition zones and habitat islands, and allowing for possible future connectivity with two brackish marshes south (inland) of Pond A2W. Proposed activities under Alternative Mountain View C are intended to increase habitat complexity and quality for special-status species. Flood control would be maintained with improvements to the southern and western levees of Charleston Slough. Several new trails and viewing platforms would be installed or replaced to improve recreation and public access at the pond cluster. Upland fill material would be imported into the ponds to raise levees, construct islands, or build habitat transition zones. To continue providing water to the City of Mountain View's Shoreline Park sailing lake, a new water intake would be constructed at the proposed breach between Pond A1 and Charleston Slough. The current water intake would be retained as a secondary intake source for backup, maintenance, etc.

Operation and Maintenance

Operation and maintenance of this pond cluster would be similar under Alternative Mountain View B and Mountain View C. However, some of those maintenance activities would occur in different places (e.g., on the west levee of Charleston Slough instead of on the west levee of Pond A1) or over a larger or smaller area (e.g., Alternative C has more trails to maintain and fewer square feet of habitat transition zones). Otherwise, the operation and maintenance activities described below apply to both action alternatives.

Operation and maintenance activities would continue to follow and be dictated by the 2009 USACE permit #2008-00103S, applicable County operations, the Refuge's Comprehensive Conservation Plan (CCP), and the AMP. PG&E would continue to operate and maintain its infrastructure, which would occur in coordination with the Refuge managers to ensure consistency with the operation and maintenance of the pond cluster. The City of Mountain View would continue to operate and maintain its properties that are adjacent to the pond cluster, which would also occur in coordination with the Refuge managers.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance activities would require a maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. AMP monitoring activities would occur, which would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there would be more trips to the site than during the non-breeding season).

In Alternative Mountain View B, the west levee of Pond A1 would require ongoing levee maintenance since it would provide flood protection. In Alternative C, this maintenance would instead take place on the western and southern levees of Charleston Slough. These levee maintenance activities would include placement of additional earth on top of, or on the sides of, the levees as the levees subside, with the level of settlement dependent upon geotechnical considerations. In general, pond levees which are improved to provide flood protection would likely exhibit the greatest degree of settlement. Levees that require erosion control measures would also require routine inspections and maintenance. If the levees that provide flood protection are improved to provide FEMA 100-year flood protection, a detailed levee maintenance plan would be required for certification to comply with FEMA standards.

The northern perimeter levee, eastern levee, and northern portion of the western perimeter levee at Pond A1, and the western levee of Pond A2W would not be maintained and would be allowed to degrade naturally. The eastern and northern levee of Pond A2W would be maintained for PG&E access.

Improved levees would be inspected and maintained for slope stability, erosion control, seepage, slides and settlement on an annual basis. Maintenance is expected to occur every 5 years to add additional fill material in areas where settlement occurs. Most of the maintenance would be accomplished during low tides and from levee crests.

Maintenance of the nesting islands may require weed/vegetation removal as often as quarterly and placing fill material (sand, gravel and/or oyster shells) before the onset of the yearly nesting period. Nesting islands would also be periodically examined for erosion.

Maintenance of habitat transition zones would include inspections and maintenance for slope stability, erosion control, seepage, slides and settlement on an annual basis. As necessary, vegetation removal would occur to prevent colonization of invasive species. Fill material would be placed, when needed, to repair areas where erosion is observed. Additional maintenance activities may also be needed to address an AMP-specified management trigger.

Public access and recreation features would be maintained as needed to keep trail surfaces safe and accessible. There would be a need for trash removal along trails and more intensely at staging areas and trailheads. The viewing platforms would be designed to minimize maintenance by utilizing durable and sustainable materials as much as possible to prevent degradation and the need for repeated maintenance. These would need to be checked periodically for defacement of interpretive boards and other forms of vandalism.

Railcar bridges placed in publicly accessible areas, such as city streets and highways must be visually inspected every two years and may be required to report on the conditions every 5 years. In Alternative Mountain View B, the bridges would not be publicly accessible, so this would not be required. However, because Alternative C would include a public access trail along the east levee of Pond A2W, the railcar bridges over the breaches there would need visually inspected and reported on as described above.

The proposed bridges and the concrete abutments with wing walls at both ends of the bridge would be basically maintenance free for the design life cycle of 50 to 75 years. The bridges' superstructures include main span girders, lateral bracing system, deck slab systems and safety railing that would need basic erosion protection maintenance work every few years. These activities include sanding, cleaning, and re-painting as needed, which are common activities for all steel structures permanently exposed to weather.

The PG&E towers, boardwalks, and power lines would be maintained in accordance with PG&E's current practices which are described in Appendix D. The maintenance of Pond A2W's east and north levees and the construction of new and improved boardwalks for PG&E's use would continue to provide the necessary access at current levels.

Alviso-A8 Pond Cluster

The Alviso-A8 pond cluster (A8 Ponds) consists of Ponds A8 and A8S and the levees surrounding each pond. This pond cluster is located in the south-central portion of the Alviso pond complex, between the Guadalupe Slough and Alviso Ponds A5 and A7 to the west, Sunnyvale Baylands County Park, Guadalupe Slough and San Tomas Aquino Creek to the south, Alviso Slough to the east and northeast, and San Francisco Bay to the north. The cities of Sunnyvale and Santa Clara are located inland of the pond cluster to the south; a capped landfill lies to the southeast.

The SBSP Restoration Project set the initial goals for this pond cluster to be tidal habitat. However, due to mercury concerns, the tidal flows needed to be "reversible". That is, the ponds needed to be modified in such a way that they could be converted back to a seasonal pond if that proved to be necessary to avoid a severe mercury problem. The SBSP Restoration Project also provided for flexibility such that later project actions could convert the ponds to fully tidal habitat, maintain or improve flood protection, and improve recreation and public access. Ponds A8 and A8S were physically connected in the Phase 1 actions and were made "reversibly muted tidal habitat" by removing parts of the levees (and associated vehicle access) between them and between Pond A8 and the adjacent Ponds A5/A7 to the west. A reversible, armored notch (smaller than a full breach that can be closed seasonally) was made in the eastern levee of Pond A8 to allow some muted tidal exchange and to allow the USFWS to vary the size of the notched opening.

Ponds A8 and A8S are configured and managed such that they can also be used as flood storage basins during high-rainfall events. Pond A8 contains an overflow weir. During flood events greater than a 10-year flood in the lower Guadalupe River and Alviso Slough, water can overflow into Pond A8 for initial flood storage. There are currently no recreation or public access features at these ponds.

Under Alternative A8 A (No Action), no new activities would occur under Phase 2. The Action Alternative (Alternative A8 B) would involve the placement of upland fill material to form habitat transition zones in the southwestern and southeastern corners of Pond A8S.

Each Phase 2 alternative at the A8 Ponds is described below and illustrated on Figures ES-10 and ES-11.

Alternative A8 A (No Action)

Under Alternative A8 A, the USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish entrainment and maintain existing levels of flood

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LEGEND

Existing reversible armored notch

Existing trail

Pond boundary

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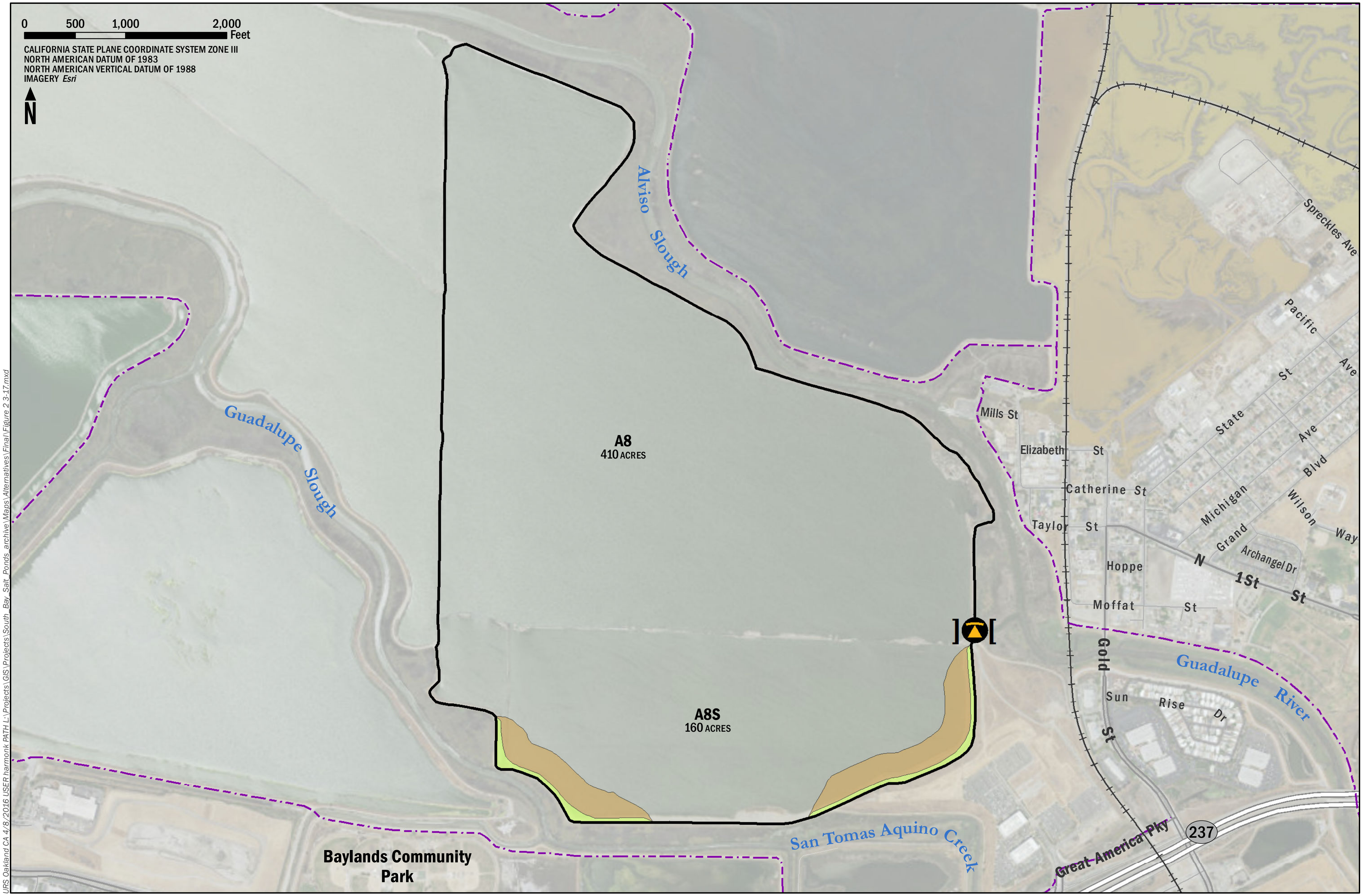
Figure ES-10

Alternative A8 A



LEGEND

Existing reversible armored notch
Existing trail
Pond boundary
Transition Zone Habitat
High marsh habitat
Intertidal habitat

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Figure ES-11
Alternative A8 B

protection; inspections of pond infrastructure to ensure the pond is operating as intended, tidal connectivity is achieved as intended, and water quality requirements are being met; and monitoring of restoration performance.

Alternative A8 B

Alternative A8 B proposes the construction of habitat transition zones in Pond A8S's southwest corner, southeast corner, or both, depending on the amount of material available. This document assumes both are constructed and analyzes the impacts associated with that assumption. The habitat transition zones would perform several functions: adding some flood protection, adding transitional habitat for salt marsh harvest mouse and Ridgway's rail, and protecting the adjacent landfill. Up to 1,400 linear feet of habitat transition zone would be established along the southwest corner of perimeter levee of Pond A8S, and up to 1,500 linear feet of habitat transition zone would be established along the southeast corner of perimeter levee of Pond A8S. The habitat transition zone for Alternative A8 B would extend into the center of the pond at a slope of 30:1(h:v) or steeper, and would start at a top elevation of 9.0 feet NAVD88.

Operation and Maintenance

The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These ongoing management practices would not change during or after the construction activities described above.

Ravenswood Pond Cluster

The Phase 2 Ravenswood pond cluster consists of Ponds R3, R4, R5, and S5; the levees surrounding each pond; some of the fringe marsh outside of these levees; and the All-American Canal (AAC). The pond cluster is bordered by Menlo Park's Bedwell Bayfront Park to the west, State Route (SR) 84 and the city of Menlo Park to the south, Ravenswood Slough to the east, and Greco Island and open bay water to the north. A small triangular pond is to the immediate west of Pond S5. This pond is unnamed and is labeled or described in various documents in three different ways: part of Pond S5, a separate but unnamed pond, or as the forebay of Pond S5. This document treats it as part of Pond S5 and frequently refers to it as the forebay.

Under Alternative Ravenswood A (No Action), no new activities would be implemented as part of Phase 2. Alternatives Ravenswood B, Ravenswood C, and Ravenswood D propose activities that would initiate the transition of Pond R4 from a seasonal pond to tidal marsh while maintaining or improving the existing flood protection and the conversion of Ponds R5 and S5 from seasonal ponds to a variety of enhanced managed pond habitat types. Upland fill material would also be placed in ponds to construct habitat transition zones in these ponds and enhance levees around them. In Pond R3, the existing western snowy plover (*Charadrius alexandrinus nivosus*) habitat would be improved by adding a water control structure to improve water circulation within the pond.

Up to several hundred thousand cubic yards of appropriate upland fill material would be imported and used in Ponds R4, R5, or S5 to enhance levees, fill borrow ditches, and build habitat transition zones. The majority of any imported fill material would be used for habitat transition zone and levee improvements; therefore, the information needed to assess the impacts of accepting and placing fill material is included in those parts of this project description.

Viewing platforms and trails would be established to improve recreation and public access to the pond cluster.

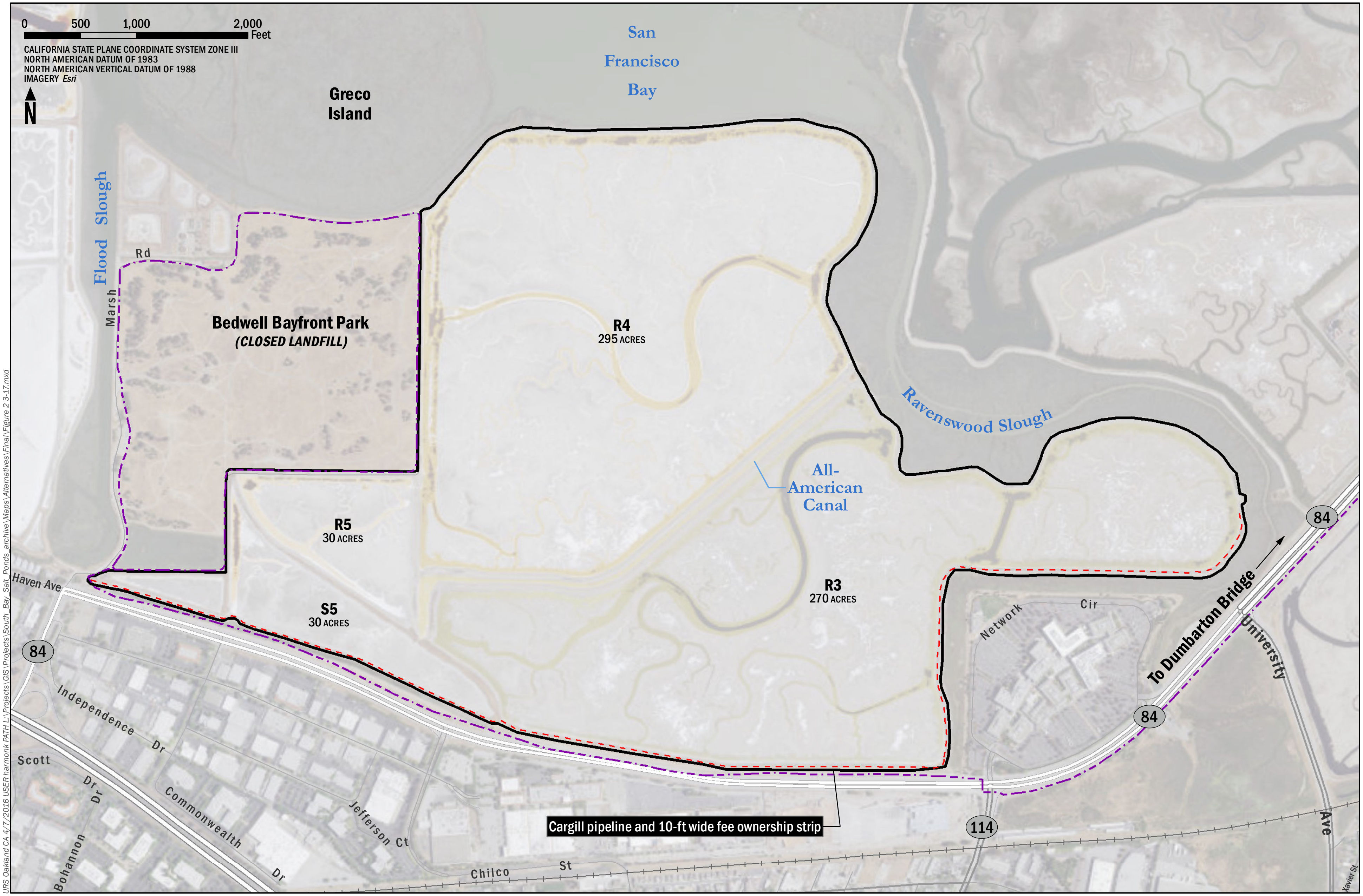
Each Phase 2 alternative at the Ravenswood Ponds is described below and illustrated on Figures ES-12 through ES-16. The Phase 2 Action Alternatives for this pond cluster are summarized in Table ES-3.

Alternative Ravenswood A (No Action)

Under Alternative Ravenswood A, the No Action Alternative, no new activities would be implemented as part of Phase 2. The USFWS would maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge system following the AMP and other management practices. The Ravenswood pond cluster would continue to be managed through the activities described in the AMP. Ponds R3, R4 and R5/S5 would function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would continue to be maintained or repaired as a component of the 2009 USACE operations and maintenance (O&M) permit #2008-00103S. Trails of the adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, would continue to be used and maintained separately.

Table ES-3. Components of the Phase 2 Action Alternatives at the Ravenswood Ponds

ALTERNATIVE RAVENSWOOD B	ALTERNATIVE RAVENSWOOD C	ALTERNATIVE RAVENSWOOD D
Improve All-American Canal levee	Improve All-American Canal levee	Improve All-American Canal levee
—	All-American Canal habitat transition zone	All-American Canal habitat transition zone
Bedwell Bayfront Park habitat transition zone	Bedwell Bayfront Park habitat transition zone	—
—	—	Pond R4 Northwest habitat transition zone
Remove parts of Ponds R5 and S5 internal levees	Remove parts of Ponds R5 and S5 levees	Remove all of Ponds R5 and S5 internal levees
—	Grade and partially fill Ponds R5/S5	—
Ponds R4/R5 water control structure	Ponds R4/R5 water control structure	Ponds R4/R5 water control structure
—	Ponds R3/S5 water control structure	Ponds R3/S5 water control structure
Pond R3/Ravenswood Slough water control structure	Pond R3/Ravenswood Slough water control structure	Pond R3/Ravenswood Slough water control structure
—	—	Connect to Bayfront Canal and Atherton Channel Project
Pond S5/Flood Slough water control structure	Pond S5/Flood Slough water control structure	Pond S5/Flood Slough water control structure
Pond R4 pilot channel	Pond R4 pilot channel	—
Pond R4 east breach	Pond R4 east breach	Pond R4 east breach
—	Pond R4 northwest breach	—
Lower Pond R4 northwest levee	Lower Pond R4 northwest levee	—
Ponds R5 and S5 bird habitat island	Ponds R5 and S5 bird habitat island	—
Viewing platform near Pond R5	Viewing platform near Pond R5	Viewing platform near Pond R5
—	Pond R4 boardwalk trail at northwest corner	Pond R4 trail on northwest levee
—	Pond R4 viewing platform	Pond R4 viewing platform
—	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail



LEGEND

Existing trail
Cargill pipeline
Pond boundary

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Figure ES-12
Alternative Ravenswood A

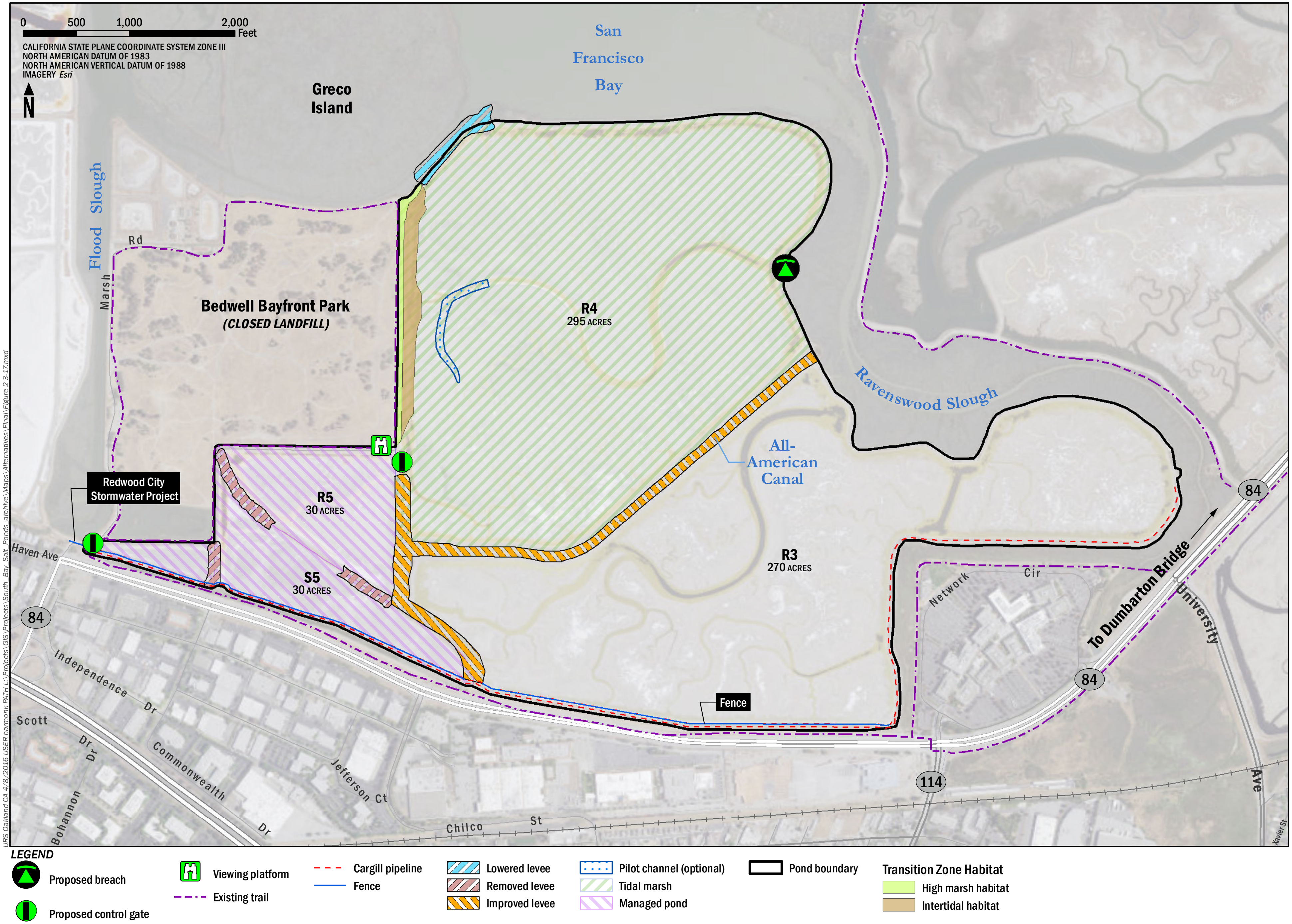

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Figure ES-13
Alternative Ravenswood B

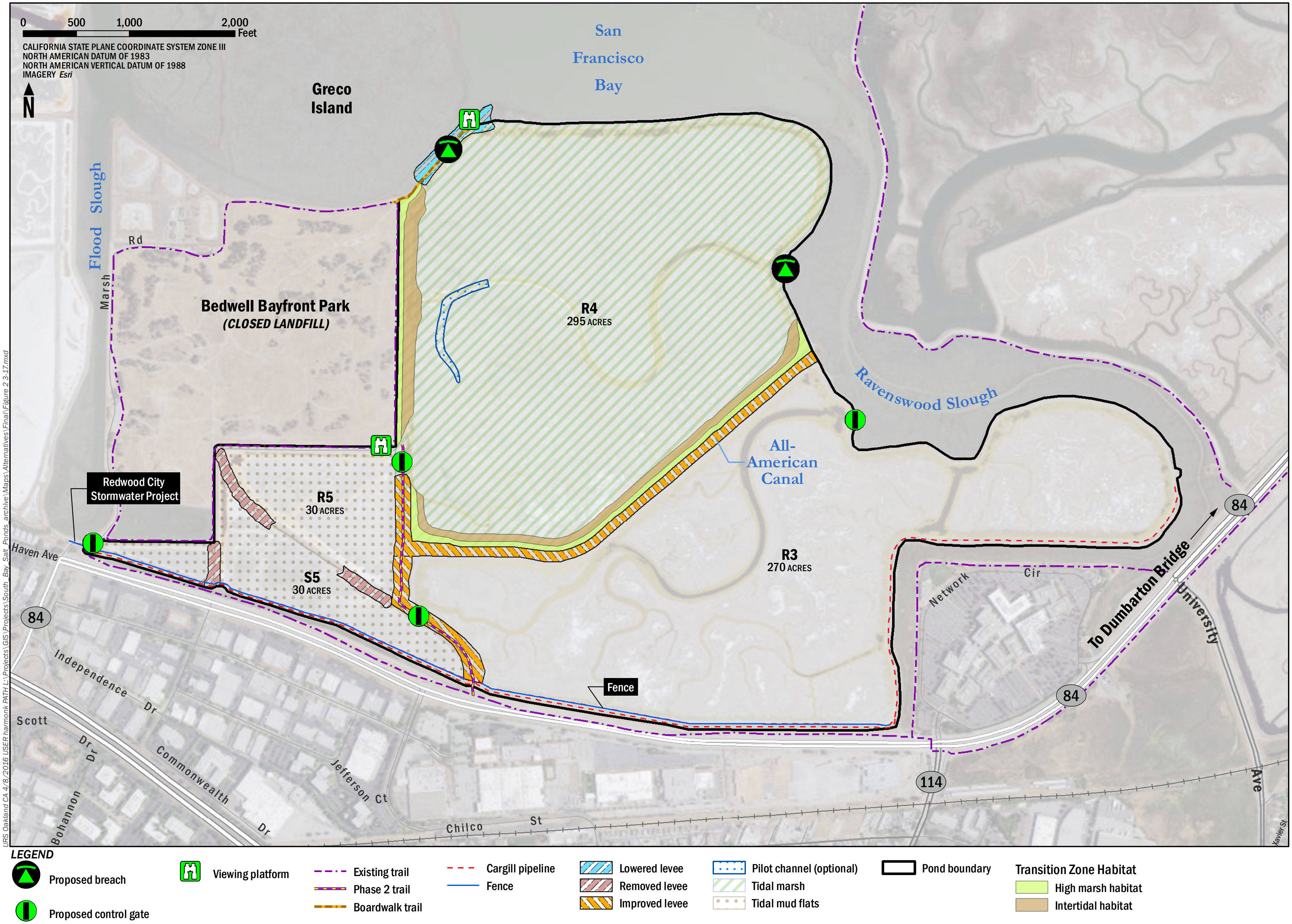

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Figure ES-14
Alternative Ravenswood C

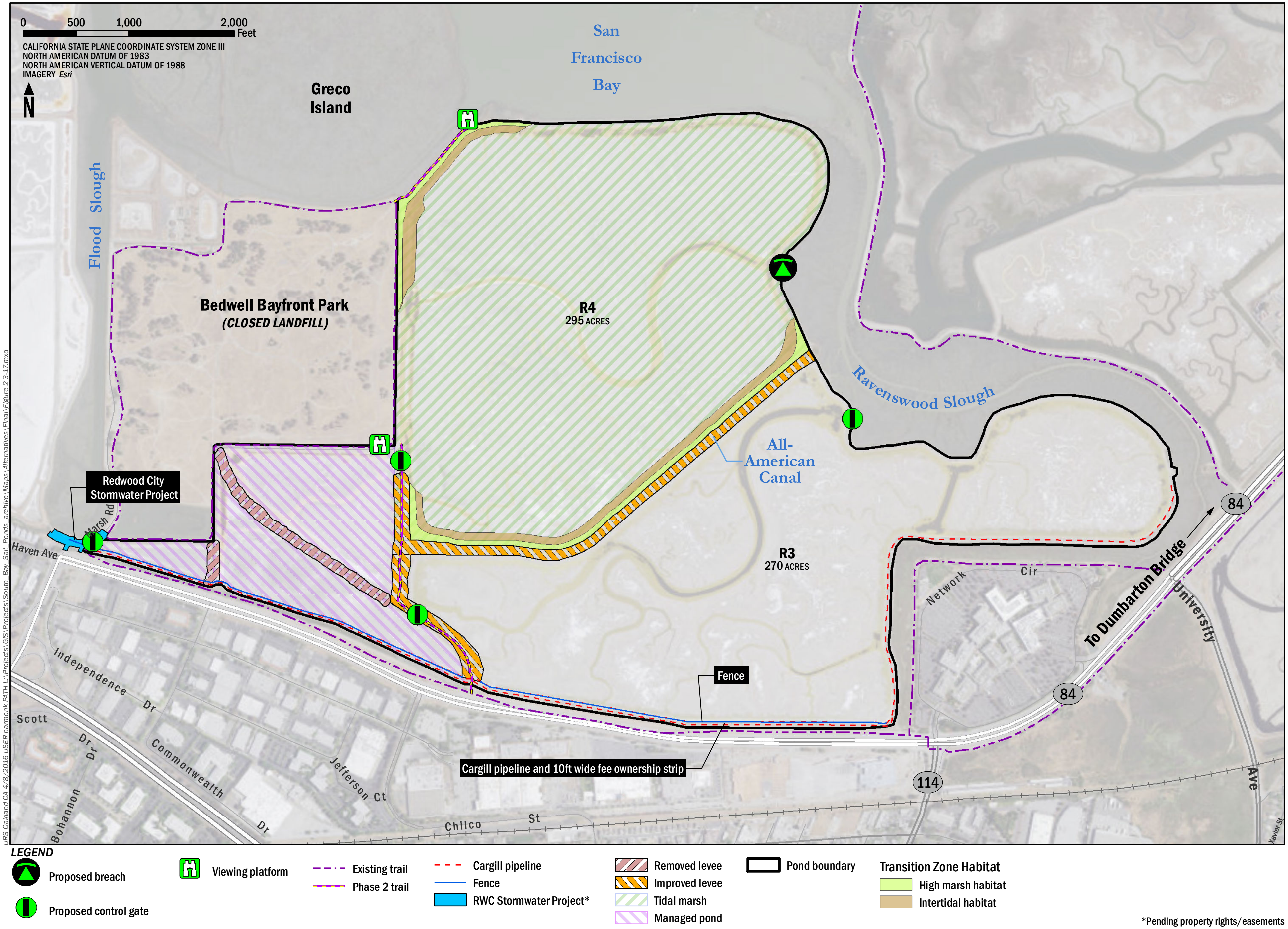

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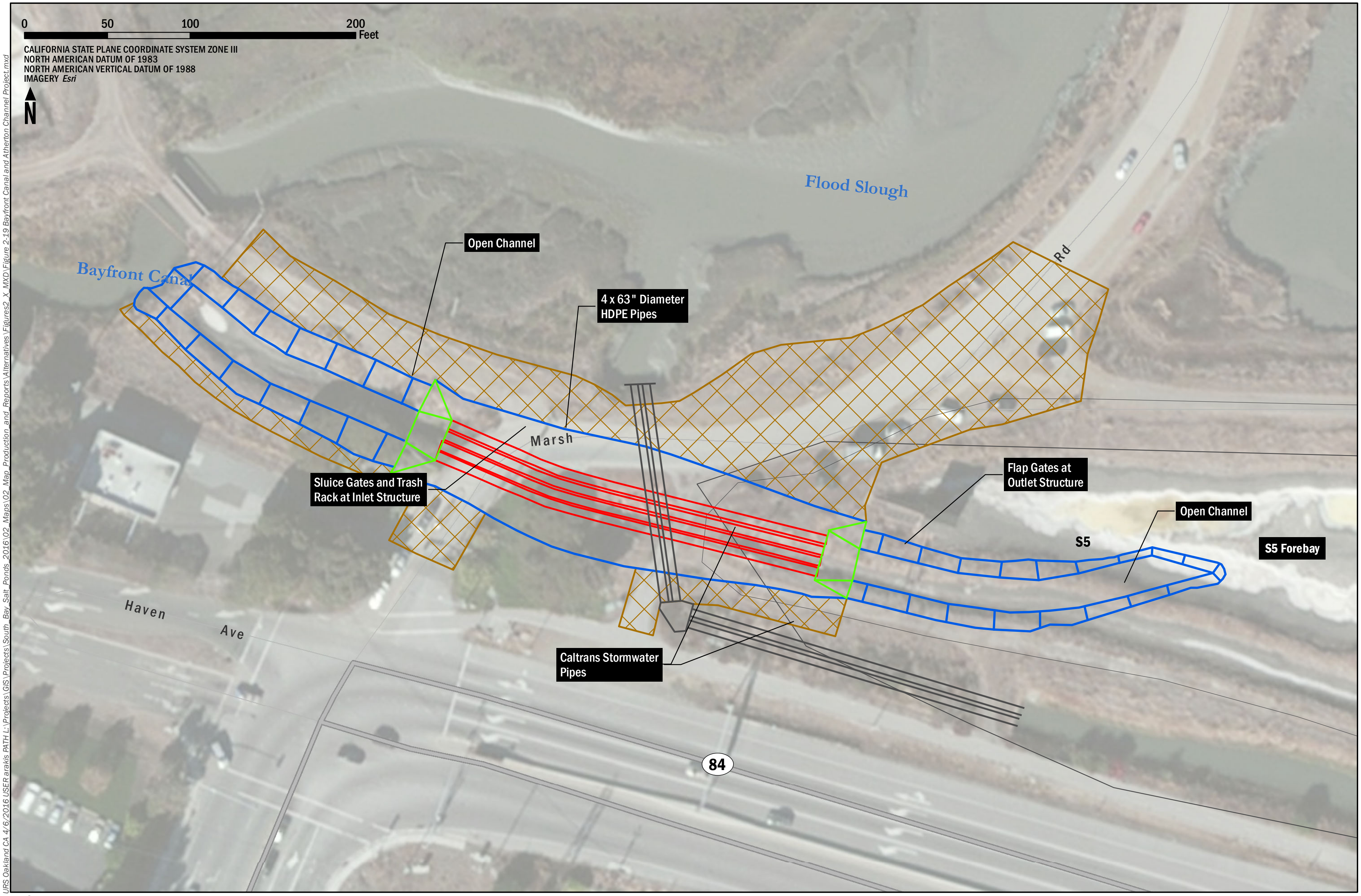
Figure ES-15
Alternative Ravenswood D



LEGEND

- Proposed new pipes
- Proposed grading boundary
- Caltrans culvert
- Staging areas
- Proposed concrete structures

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Figure ES-16
Bayfront Canal and Atherton Channel Project

Alternative Ravenswood B

Alternative Ravenswood B would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create habitat transition zone along the western edge of Pond R4, establish managed ponds to improve habitat for diving and dabbling birds, increase pond connectivity, and improve recreation and access. Surplus upland fill material (after completing the habitat transition zone and improving levees) would be used to fill borrow ditches and speed tidal marsh restoration.

Alternative Ravenswood C

Alternative Ravenswood C would be similar to Alternative Ravenswood B with the following exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond that is maintained at mud flat elevation for shorebirds; water control structures would be installed on Pond R3 to allow for improvement to the habitat for western snowy plover; an additional habitat transition zone would be constructed; and additional recreational and public access components would be constructed.

Alternative Ravenswood D

Alternative Ravenswood D would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create two habitat transition zones in Pond R4, establish enhanced managed ponds in Ponds R5 and S5, increase pond connectivity, enhance Pond R3 for western snowy plover habitat, remove the levees within and between Ponds R5 and S5, and improve recreation and public access. Alternative Ravenswood D would also allow stormwater outflow from Redwood City to Ponds R5 and S5 (via connections with the Bayfront Canal and Atherton Channel), including open channel improvements, installation of a system of pipes or culverts, temporary removal of California Department of Transportation (Caltrans) stormwater pipes, and installation of a water control structure. This alternative would address a problem with residual salinity in Ponds S5 and R5 and would reduce flood risk in the neighborhood to the southwest.

Operation and Maintenance – All Action Alternatives

Operation and maintenance activities for components of the pond cluster within the Refuge would continue to follow and be dictated by the 2009 USACE permit #2008-00103S, the CCP, applicable County operations, and the AMP. The City of Menlo Park would continue to operate and maintain its properties that are adjacent to the pond cluster, in coordination with the Refuge managers. In Alternative Ravenswood D, the City of Redwood City would also coordinate its management and maintenance of the Bayfront Canal and Atherton Channel water diversion system with other O&M activities, as described below.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require a staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Operation of the water control structures would require additional staff visits. In addition, AMP monitoring activities would occur, which would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there would be more trips to the site than during the non-breeding season).

Ongoing levee maintenance would continue for existing levees that provide flood protection (as part of O&M activities described above and in consistency with the 2009 USACE permit #2008-00103S and the CCP). Levee maintenance activities would include the placement of additional earth on top of or on the pond side of the levees as the levees subside, with the level of settlement dependent upon geotechnical considerations. In general, pond levees that are improved to provide flood protection would likely exhibit the greatest degree of settlement. Levees that require erosion control measures would also require routine inspections and maintenance. The northern perimeter levee at Pond R4 would not be maintained and would be allowed to degrade naturally.

Improved levees shall be inspected and maintained for slope stability, erosion control, seepage, slides and settlement on an annual basis. Maintenance is expected every 5 years to add additional fill material in areas where settlement occurs. Most of the maintenance work can be accomplished during low tides and from levee crests. If the levees that provide flood protection are improved to provide FEMA 100-year flood protection, a detailed levee maintenance plan would be required for certification to comply with FEMA standards.

Water control structures would require inspection for structural integrity of gates, pipes, and approach way, obstruction to flow passage and preventative maintenance such as visual functionality of gates, seals, and removal of debris. In Alternative Ravenswood D only, these same activities would be required for the Redwood City stormwater connection. Inspection would be required every month until the first year and semi-annually thereafter. Maintenance would be required on an annual basis. O&M would be accomplished during low tides in Pond R4 and sloughs and by maintaining low storage conditions in the managed ponds.

Maintenance of habitat transition zones would include inspections and maintenance for slope stability, erosion control, seepage, slides, and settlement on an annual basis. As necessary, vegetation removal would occur to prevent colonization of invasive species. Fill material would be placed, when needed, to respond to areas where erosion has been observed. Maintenance activities would also be dictated by the AMP if an AMP management trigger is reached, especially a trigger related to a biological resource (e.g., salt marsh harvest mouse) that would utilize habitat transition zone as habitat.

Maintenance of public access and recreation features are similar but not identical across the Action Alternatives. The viewing platforms would be designed to minimize maintenance utilizing durable and sustainable materials as much as possible to prevent degradation and the need for repeated maintenance. All features would need to be checked periodically for defacement of interpretive boards and other forms of vandalism. Alternatives Ravenswood C and D would also include trail grooming to keep them safe and accessible. There would be a need for trash removal along trails and more intensely at staging areas and trailheads.

Operations and maintenance of water levels in Ponds R3, R5, and S5 would differ across the three action alternatives, as described below.

Alternative Ravenswood B:

- The water levels in Ponds R5 and S5 would be actively managed year-round by opening and closing the water control structures as needed to maintain desired surface elevations, flows, and water quality. The salinity of these ponds would also be somewhat controlled through the use of the water control structures. USFWS Refuge staff would operate the water control structures and provide maintenance and cleaning as needed.

- The water levels of Pond R3 would be actively managed using one new water control structure to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate all of the water control structures and provide maintenance and cleaning as needed.

Alternative Ravenswood C:

- The water levels in Ponds R5 and S5 would be actively managed year-round by opening and closing the water control structures as needed to maintain desired surface elevations, flows, and water quality. Water surface elevation in Ponds R5 and S5 would be managed to receive regular damped or muted tidal flows and maintain the pond bottoms at an intertidal elevation to form mudflats for shorebirds. The salinity of these ponds would also be somewhat controlled through the use of the water control structures. In addition, water would be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or other management purposes.
- The water levels of Pond R3 would be actively managed using two new water control structures to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate all of the water control structures and provide maintenance and cleaning as needed.

Alternative Ravenswood D:

- The water levels in Ponds R5 and S5 would be actively managed year-round using the water control structures that would be installed as a part of meeting the habitat restoration goals of these ponds. Water surface elevation in Ponds R5 and S5 would be managed to create open water habitat for diving and dabbling ducks and other birds. Water levels would be maintained such that bottom depths are at subtidal elevations except during storm events. Prior to and during storm events when the tide in Flood Slough is high, the ponds would be drawn down to provide capacity for temporary detention of stormwater runoff from the City of Redwood City. Stormwater would enter into Pond S5 through new water control structures that would be installed to connect the Redwood City storm drain outflow to the forebay of Pond S5. This stormwater would then be discharged back into Flood Slough through a new water control structure between the pond and the slough when the tide is low and the slough can accept that volume of stormwater. The salinity of Ponds R5 and S5 would also be somewhat controlled through the use of the water control structures by receiving low salinity stormwater. Additionally, water would also be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or for salinity dilution or other management purposes.
- The water levels of Pond R3 would be actively managed using two new water control structures to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate the water control structures for habitat and water quality management purposes and provide maintenance and cleaning as needed.

Identification of the Phase 2 Preferred Alternative

This section identifies the Preferred Alternative, as it would be implemented at each of the four pond clusters evaluated for Phase 2 at the Refuge ponds. The federal and state lead agencies (the USFWS and the State Coastal Conservancy, respectively) along with the Project Management Team and other project partners did not specify a Preferred Alternative in the Draft EIS/R for Phase 2. Instead, by waiting until this Final EIS/R to make that decision, they were able to incorporate input received from the public, regulatory agencies, and other stakeholders on the Draft EIS/R's alternatives and impact analyses to factor into the decision about the Preferred Alternative. Many of the comments on the Draft EIS/R contained statements supporting or opposing particular components of the alternatives in the document.

Those comments informed and shaped the selection of the Preferred Alternative from individual components from the various action and no-action alternatives presented in the Draft EIS/R, as well as minor adjustments and some recombination of them into a complete Preferred Alternative. Further, as was described in the 2007 EIS/R and other project planning documents, the SBSP Restoration Project's approach has been to take the lessons learned from each project phase and from the ongoing applied studies and other scientific research and monitoring and allow them to inform future phases and determine the ultimate outcome. These observations and results were also used to shape the selection of components to form the Preferred Alternative.

Finally, the selection of project components to include in the Phase 2 Preferred Alternative was shaped by a sense of how the SBSP Restoration Project's goals and objectives could be met while minimizing the environmental impacts associated with various parts of the project implementation. Many of these potential impacts resulted from the volumes of fill that would need to be imported and placed into the ponds. Although these impacts were found to be less than significant in the Draft EIS/R, the realization that the purpose and need of the project could be met while further reducing associated impacts drove the decision making process. Feasibility, constructability, and regulatory constraints were also carefully considered. The selection of the Preferred Alternative is further discussed by pond cluster in Chapter 6.

The Phase 2 Preferred Alternative provides a variety of restoration enhancements at all four pond clusters, as well as maintained or increased flood protection and additional public access and recreation features at two of the Phase 2 pond clusters. It would be implemented as follows:

- Island Ponds – Alternative Island B with the addition of one restoration component from Alternative Island C.
- Mountain View Ponds – Alternative Mountain View B with substitution of one habitat enhancement and the addition of one public access component drawn from Alternative Mountain View C. Additionally, one of the flood protection features presented in the two action alternatives would be modified.
- A8 Ponds – Alternative A8 B with a refinement to increase the top elevation of the proposed transition zones in order to provide greater erosion protection.
- Ravenswood Ponds – Alternative Ravenswood B with the addition of the habitat transition zone and trail on the eastern edge of Ponds R5 and S5, components incorporated from Alternatives Ravenswood C and D.

Figures ES-17 through ES-20 illustrate the Preferred Alternative as it would be implemented at each of the Phase 2 pond clusters. The pond cluster-specific components are discussed in detail in Chapter 6.

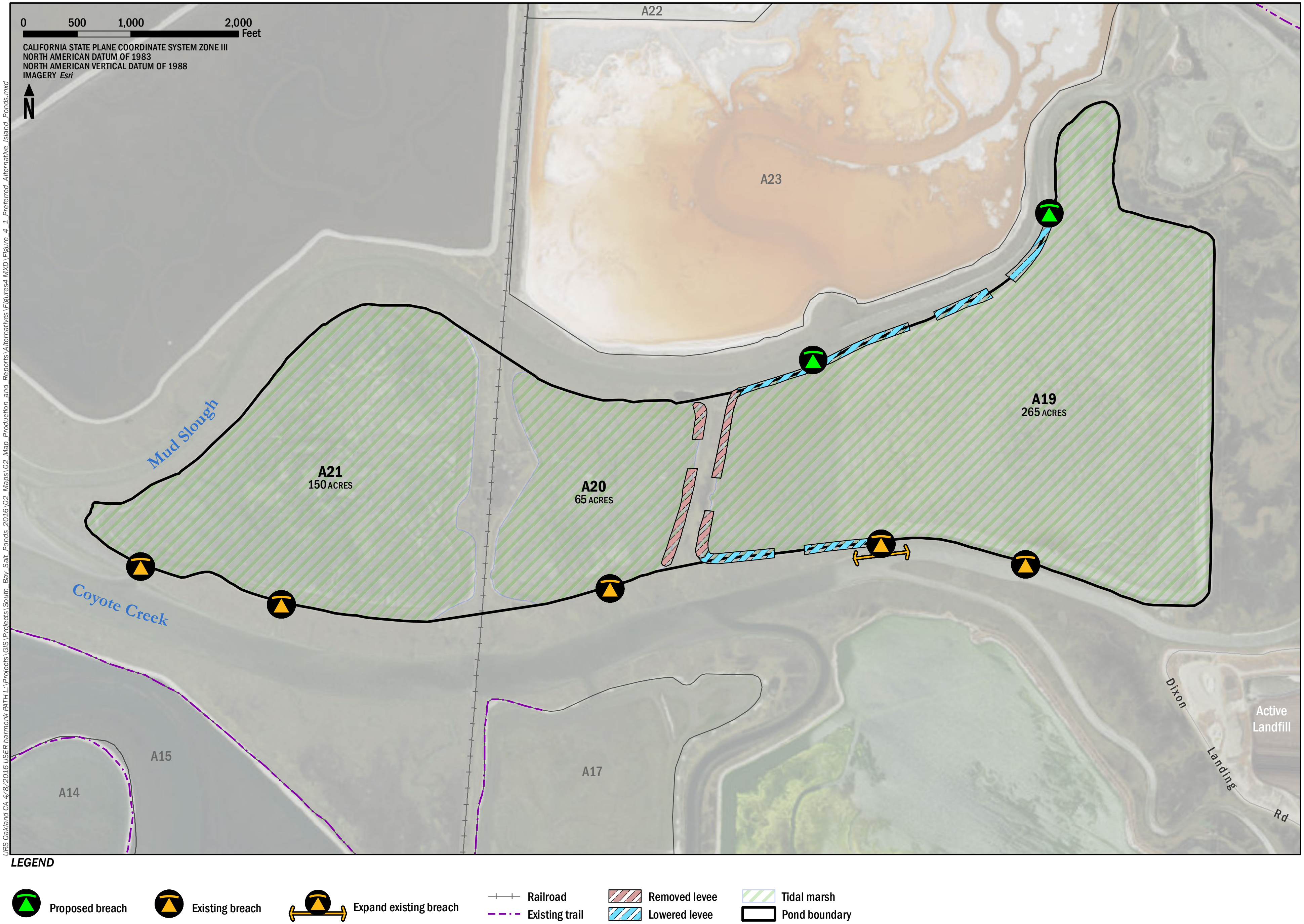

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Figure ES-17

Preferred Alternative Island Ponds

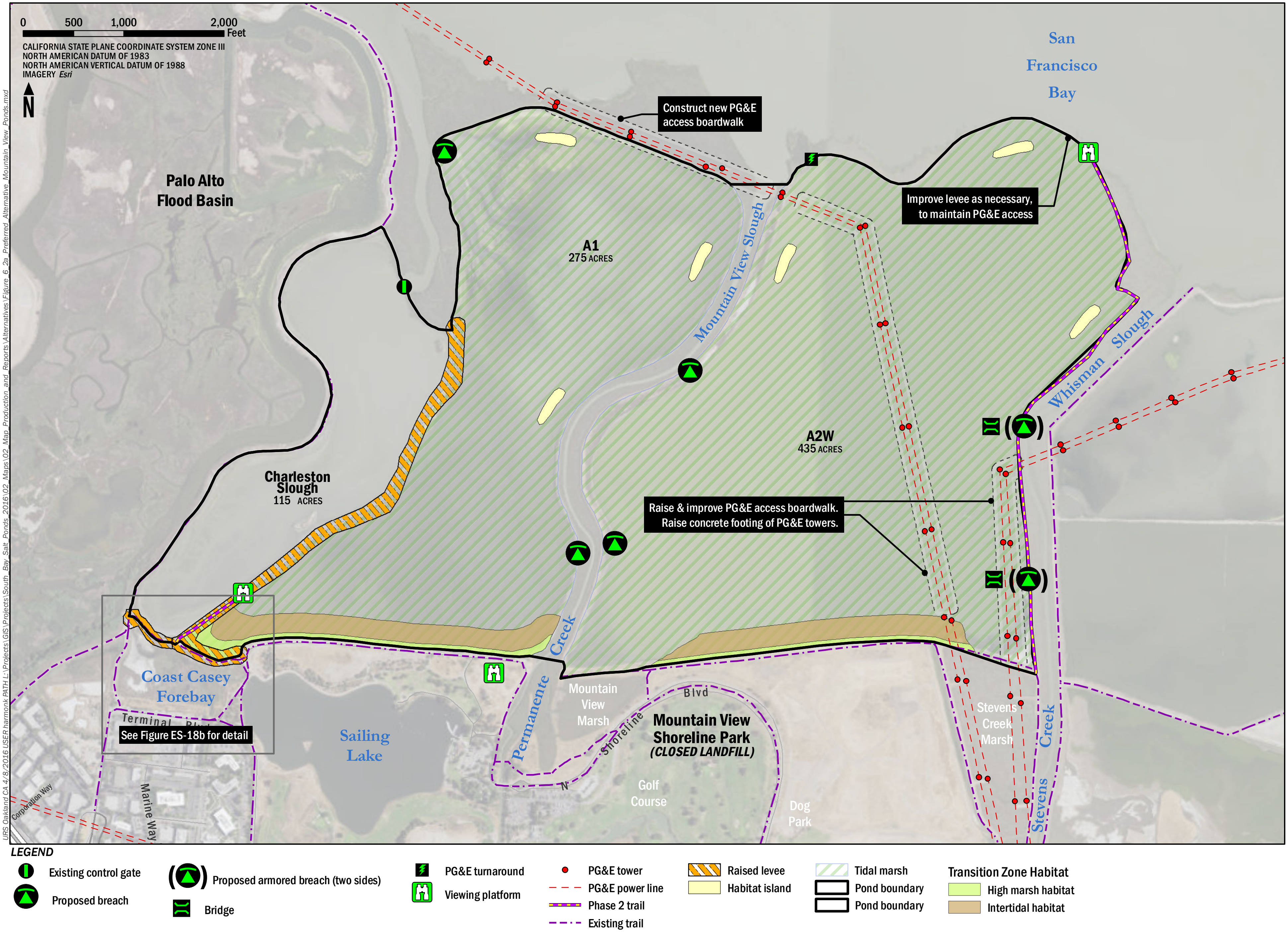

Figure ES-18a

Preferred Alternative Mountain View Ponds

LEGEND

Exsiting pipeline

Existing general feature

Extent of levee improvements

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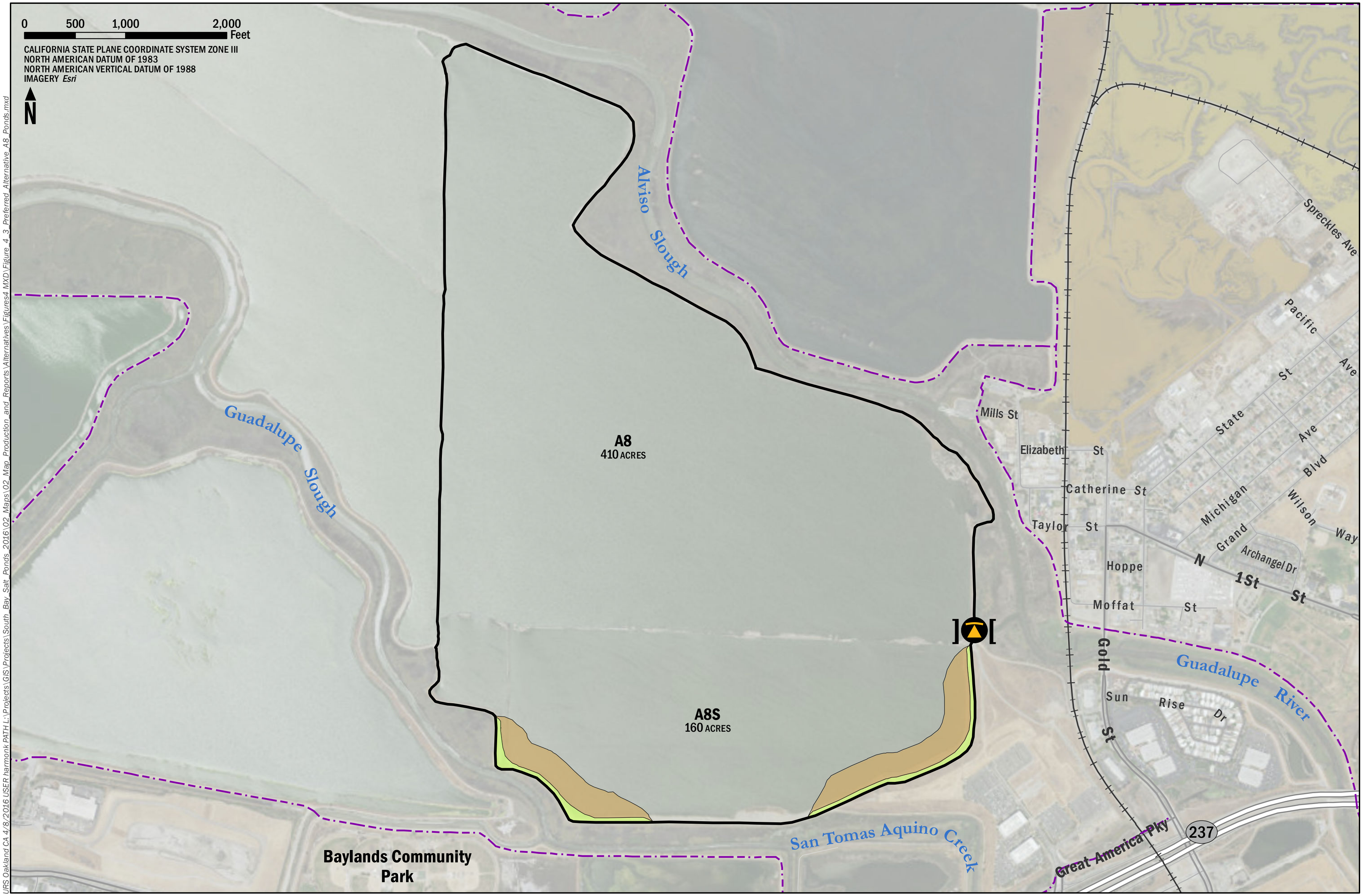
Figure ES-18b

Preferred Alternative Mountain View Ponds - Detail



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LEGEND

- Existing reversible armored notch
- Railroad
- Existing trail
- Pond boundary

Transition Zone Habitat

- High marsh habitat
- Intertidal habitat

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Figure ES-19

Preferred Alternative A8 Ponds

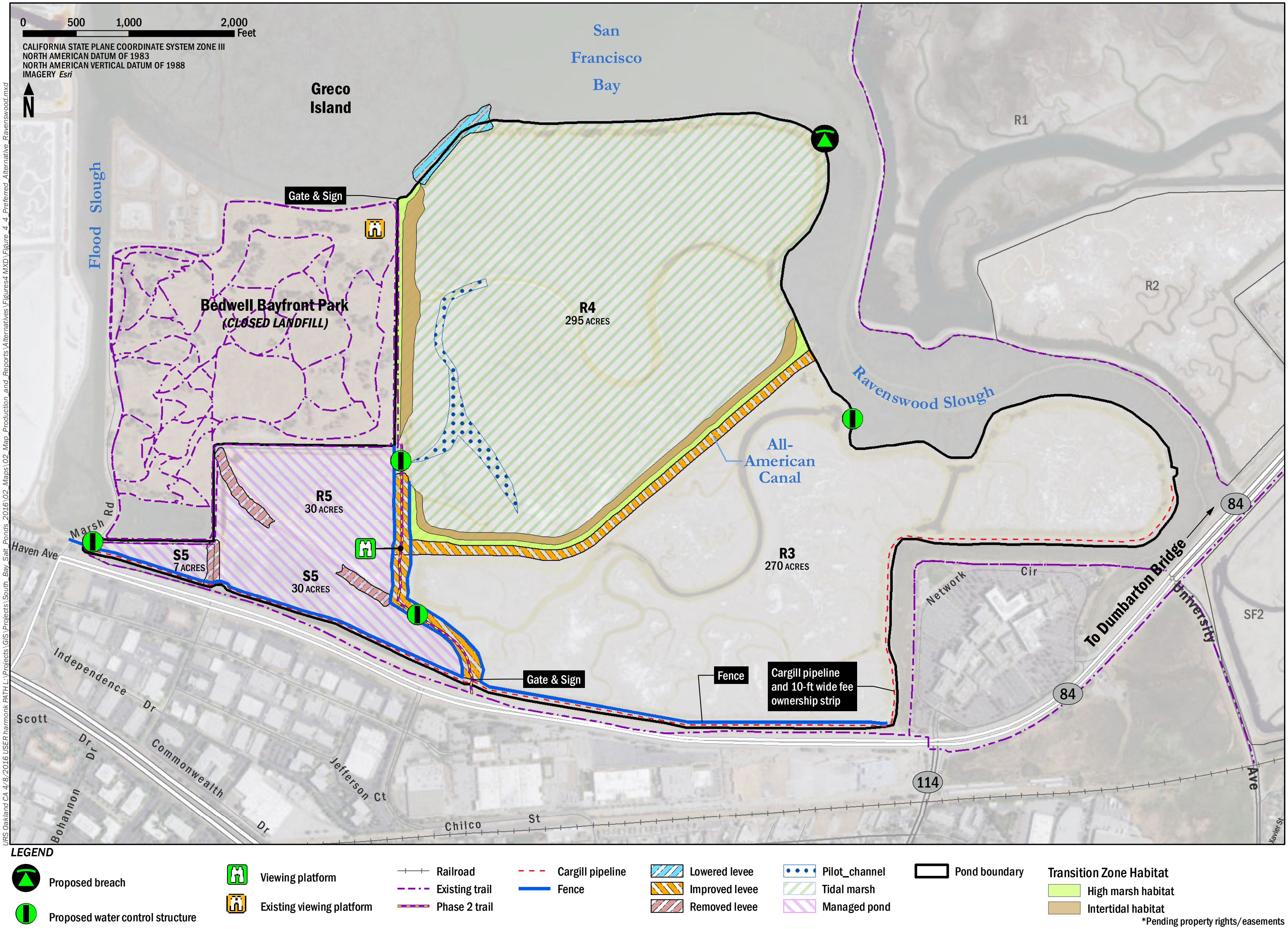

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Figure ES-20
Preferred Alternative Ravenswood Ponds

The Preferred Alternative, including all elements and refinements planned at each pond cluster, is made up entirely of project components that were presented and analyzed in the Draft EIS/R [release date July 24, 2015]. The alternatives analysis is again included in Chapters 3 through 5 of this Final EIS/R. The combinations of project components that comprise the Preferred Alternative are somewhat different than those presented in the Draft EIS/R's action alternatives; however no new components, analyses, significant impacts, or mitigation measures are included in this Final EIS/R. In a few cases, minor clarifications and refinements were made to individual project components either in response to suggestions received in public and/or agency comments or as a result of guidance received from regulatory agencies. In others cases, project design has been improved and/or enhanced since the Draft EIS/R was initially circulated. These enhancements would improve the restoration and flood protection goals and/or increase the likelihood of successfully achieving the project goals. These changes do not increase, and in most cases decrease, the potential for significant environmental impacts. These clarifications or refinements are discussed in detail in Chapter 6, Preferred Alternative.

S.2 Purpose of the EIS/R

This EIS/R is intended to provide the public and responsible and trustee agencies with information about the potential environmental effects of the SBSP Restoration Phase 2 Project. It will be used by the lead agencies when considering approval of the SBSP Restoration Project.

The CEQ regulations for implementing NEPA (40 CFR 1502.1) state that

> "the primary purpose of an [EIS] is to serve as an action-forcing device to ensure that the policies and goals defined in [NEPA] are infused into the ongoing programs and actions of the federal government. An EIS shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

CEQA Section 21002.1 states that the purpose of an EIR is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided.

Both NEPA and CEQA encourage the preparation of combined environmental planning documents. This document is a joint EIS/R. As noted above, NEPA and CEQA have similar purposes and thus use generally similar concepts and terminologies. In some cases, different terms are used to convey the same meaning. This joint Final EIS/R primarily uses CEQA terminology; however, many NEPA terms are also used.

S.3 Role of Adaptive Management in the SBSP Restoration Project

The 2007 EIS/R acknowledged that significant uncertainties remain with the project because of its geographic and temporal scale. To address these uncertainties, the project was planned to be carefully implemented in phases, with learning from the results incorporated into management and planning decisions. This adaptive management approach is described in the AMP (Appendix D), which is a comprehensive plan and program to generate information (applied studies, monitoring, and research) that the Project Management Team (PMT) can use to make decisions about both current management of the project area and future restoration actions to meet project objectives and avoid harmful impacts to the environment.

Adaptive management is essential to keeping the project on track to meet its objectives, and adaptive management was the primary tool that the 2007 EIS/R identified for avoiding significant impacts to the environment. Without adaptive management (and its associated information collection), the PMT would not understand the restored system and would not be able to explain its management actions to the public. Furthermore, responses to unanticipated changes would be based on guesswork, which could exacerbate problems. For these reasons, adaptive management is integral to the project, and construction projects are expected to feature applied studies, as called for in the AMP, so that the PMT can learn from project implementation. Adaptive management continues to be a significant part of Phase 2.

Although the preferred alternative in the 2007 EIS/R was Programmatic Alternative C, which would restore up to 90 percent of the project's ponds to tidal wetlands in phases, the document also states that if that alternative is not possible without causing undesired environmental impacts, as detected through the AMP and other adaptive management monitoring and applied studies, then the project would stop converting ponds to tidal wetlands. The actual amount of tidal wetlands restored at the end of the 50-year project horizon could be less than 90 percent.

S.4 Summary of Impacts and Mitigation Measures

This section summarizes the impacts and the resulting significance determinations made for each of them, as well as any mitigation measures that were developed to reduce the amounts and types of adverse impacts from the various project alternatives. Note that the program-level mitigation measures developed for the SBSP Restoration Project as a whole were incorporated into the Phase 2 alternatives as part of the project itself. Thus, they are no longer mitigation measures, but simply part of the project designs. The full list of program-level mitigation measures is presented in Chapter 2 of the main text.

S.4.1 Impacts Resulting from Phase 2 Alternatives

Table ES-4 summarizes the results of the impacts analysis that makes up Chapter 3. For each action and no action alternative at each pond cluster, the table presents the significance determination for each enumerated impact within each environmental resource. The table also includes a column showing the significance determinations by impact for the Phase 2 Preferred Alternative, discussed in Chapter 6.

Potentially Significant Impacts

The impact analysis and significance determination conducted for this Final EIS/R and explained in full in Chapter 3 identified the potentially significant impacts listed below. These are those impacts that could not be reduced to a less-than-significant level, even after implementation of project-specific mitigation measures or because no appropriate project-level mitigation measures exist that would that have that effect. In these rare cases, these impacts are significant.

- Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine. One of the thresholds of significance for this impact included not providing “maximum feasible public access, consistent with the proposed project.” While the Phase 2 actions would add a several new public access and recreation features at two pond clusters, others had to be removed from implementation under Phase 2 because of concerns over recreation-based impact on sensitive wildlife species. These impacts are Potentially Significant, however, because the question of “consistent with the proposed project” cannot be answered with certainty at this time. It is possible that these features could have been implemented without disturbing wildlife, in which case the decision not to add them would have failed to achieve maximum feasible access. It is also possible that the decision was correct, and that those public access features would not have been consistent with the project goals of "wildlife-compatible recreation." Careful monitoring under the AMP would be used to measure wildlife responses to public access features and consider their addition in future project phases, if consistent with the project.

- Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use. These impacts are Significant and Unavoidable at the Alviso-Mountain View Ponds and at the Ravenswood Ponds, where existing parking areas, park access, and some trails would necessarily be temporarily closed during portions of the construction work. This is a matter of public safety in combination with the need to bring materials and equipment through existing city parks to reach the project ponds themselves.

Phase 2 Mitigation Measures Identified in the EIS/R

There is only one project-level mitigation measures developed for the Phase 2 alternatives. It is described in Section 3.11, Traffic, and it is called Phase 2 Mitigation Measure 3.11-1: Modify Signal Timing. That mitigation measure says that the landowner (USFWS) shall coordinate with Caltrans and/or the City of Menlo Park to modify the intersection signal timing in the a.m. to reduce project-related delay to a level that the City does not deem significant.

Cumulative Impacts

Chapter 4 of this Final EIS/R also evaluated the potential environmental impacts of the proposed project when considered together with other projects. The analysis addressed impacts that could occur as a result of project construction and operation, based on the significance criteria provided for each resource discussion in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

The analysis of cumulative impacts followed a multi-step approach. First, an evaluation was made as to whether a significant cumulative impact existed within each relevant study area for the impact under consideration. This evaluation was made by reviewing the conclusions of the No Action Alternative in the "Cumulative Impacts" section of the 2007 EIS/R. Then those conclusions were re-examined based on an updated list of relevant cumulative impact projects. Next, the Phase 2 project impacts were evaluated as to whether they, in combination with impacts from the other projects, would create a new significant cumulative impact. If so, then a potentially significant impact was found, and mitigation measures from Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, were identified and recommended to reduce this impact to a less-than-significant level. In cases where a significant cumulative impact already existed, even without the SBSP Restoration Project, the Phase 2 project's impacts were examined to determine if they would make a considerable contribution to that impact. If it was determined that the Phase 2 project impacts would not make a considerable contribution to a significant cumulative impact, the impacts were determined to be less than significant.

If a Phase 2 project impact were to have a considerable contribution to a cumulative impact, then mitigation from the project impact analysis in Chapter 3 would be recommended to reduce the project's contribution to cumulative impacts to a level that is less than considerable. However, no considerable contributions to a cumulative impact were found.

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
3.2 Hydrology, Flood Management, and Infrastructure													
Phase 2 Impact 3.2-1: Increased risk of flooding that could cause injury, death, or substantial property loss**.**	LTS	LTS	LTS	LTS	LTS	LTS/B	LTS	LTS	LTS	LTS	LTS	LTS/B	LTS
Phase 2 Impact 3.2-2: Alter existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.2-3: Create a safety hazard for people boating in the project area.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.2-4: Potential effects from tsunami and/or seiche.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.3 Water Quality and Sediment													
Phase 2 Impact 3.3-1: Degradation of water quality due to changes in algal abundance or composition.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-2: Degradation of water quality due to low dissolved oxygen levels.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-3: Degradation of water quality due to increased methylmercury production or mobilization of mercury-contaminated sediments.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-4: Potential impacts to water quality from other contaminants.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-5: Potential to cause seawater intrusion of regional groundwater sources.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.4 Geology, Soils, and Seismicity													
Phase 2 Impact 3.4-1: Potential effects from settlement due to consolidation of Bay mud.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-2: Potential effects from liquefaction of soils and lateral spreading.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-3: Potential for ground and levee failure from fault rupture.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.4-4: Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.	LTS	LTS	LTS	NI	NI	NI	NI	LTS	NI	NI	NI	LTS	LTS
3.5 Biological Resources													
Phase 2 Impact 3.5-1: Potential reduction in numbers of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS/B	LTS	NI	LTS/B	NI	LTS	LTS/B	LTS	LTS
Phase 2 Impact 3.5-2: Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS/B	LTS	LTS
Phase 2 Impact 3.5-3: Potential habitat conversion impacts to western snowy plovers.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-4: Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-5: Potential reduction in the numbers of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-6: Potential reduction in foraging habitat for diving ducks, resulting in declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS	LTS/B	LTS
Phase 2 Impact 3.5-7: Potential reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS	LTS/B	LTS
Phase 2 Impact 3.5-8: Potential habitat conversion impacts on California least terns.	NI	NI	NI	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS/B	LTS/B	LTS

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.5-9: Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew, and further isolation of these species' populations due to breaching activities and scour.	LTS/B	LTS/ B	LTS/ B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.5-10: Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-11: Potential construction-related loss of or disturbance to nesting pond associated birds.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-12: Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-13: Potential effects of habitat conversion and pond management on steelhead.	LTS/B	LTS/ B	LTS/ B	NI	LTS/B	LTS	NI	LTS	NI	NI	NI	NI	LTS/B
Phase 2 Impact 3.5-14: Potential impacts to estuarine fish.	LTS/B	LTS/ B	LTS/ B	NI	LTS/B	LTS	NI	NI	NI	LTS/B	LTS	LTS/B	LTS/B
Phase 2 Impact 3.5-15: Potential impacts to piscivorous birds.	LTS/B	LTS/ B	LTS/ B	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.5-16: Potential impacts to dabbling ducks.	LTS/B	LTS/ B	LTS/ B	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-17: Potential impacts to harbor seals.	LTS/B	LTS/ B	LTS/ B	NI	LTS/B	LTS/B	NI	NI	NI	NI	NI	NI	LTS/B
Phase 2 Impact 3.5-18: Potential recreation-oriented impacts to sensitive species and their habitats.	LTS	LTS	LTS	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-19: Potential impacts to special-status plants.	NI	LTS	LTS	NI	NI	NI	NI	NI	NI	NI	NI	NI	LTS

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.5-20: Colonization of mudflats and marsh plain by non-native *Spartina* and its hybrids.	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-21: Colonization by non-native *Lepidium*.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-22: Increase in exposure of wildlife to avian botulism and other diseases.	NI	NI	NI	NI	NI	NI	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-23: Potential impacts to bay shrimp populations.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-24: Potential impacts to jurisdictional wetlands or waters.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-25: Potential construction-related loss of, or disturbance to, nesting raptors (including burrowing owls).	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.6 Recreation Resources													
Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.	NI	LTS	LTS	PS	PS	LTS/B	NI	NI	PS	PS	LTS/B	LTS/B	PS
Phase 2 Impact 3.6-2: Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.6-3: Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	LTS	LTS	LTS

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.6-4: Result in substantial adverse physical impacts associated with the provision of new or physically altered park and recreational facilities, or result in the need for new or physically altered park and recreational facilities, the construction of which could cause significant environmental impacts.	NI	NI	NI	NI	LTS/B	LTS/B	NI	NI	NI	LTS	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use.	NI	NI	NI	NI	SU	SU	NI	NI	NI	SU	SU	SU	SU
3.7 Cultural Resources													
Phase 2 Impact 3.7-1: Potential disturbance of known or unknown cultural resources.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.7-2: Potential disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.8 Land Use and Planning													
Phase 2 Impact 3.8-1: Land use compatibility impacts.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.9 Public Health and Vector Management													
Phase 2 Impact 3.9-1: Potential increase in mosquito populations.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.10 Socioeconomics and Environmental Justice													
Phase 2 Impact 3.10-1: Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.	NI	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.10-2: Change lifestyles and social interactions.	NI	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.10-3: Effects disproportionately placed on densely populated minority and low-income communities or effects or racial composition in a community.	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE
3.11 Traffic													
Phase 2 Impact 3.11-1: Potential short-term degradation of traffic operations at intersections and streets due to construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTSM	LTSM	LTSM	LTS
Phase 2 Impact 3.11-2: Potential long-term degradation of traffic operations at intersections and streets during operation.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.11-3: Potential increase in parking demand.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.11-4: Potential increase in wear and tear on the designated haul routes during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.12 Noise													
Phase 2 Impact 3.12-1: Short-term construction noise effects.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-2: Traffic-related noise impacts during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-3: Traffic-related noise effects during operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-4: Potential operational noise effects from O&M activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-5: Potential vibration effects during construction and/or operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.13 Air Quality													
Phase 2 Impact 3.13-1: Short-term construction-generated air pollutant emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-2: Potential long-term operational air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.13-3: Potential exposure of sensitive receptors to TAC emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-4: Potential odor emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.14 Public Services													
Phase 2 Impact 3.14-1: Increased demand for fire and police protection services.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
3.15 Utilities													
Phase 2 Impact 3.15-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	NI	NI	NI	LTS
Phase 2 Impact 3.15-2: Reduced clearance between waterways and PG&E electrical transmission lines.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	NI	NI	LTS
Phase 2 Impact 3.15-3: Reduced structural integrity of PG&E towers.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-4: Changes in water level, tidal flow and sedimentation near storm drain systems.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-5: Changes in water level, tidal flow and sedimentation near pumping facilities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-9: Reduced access to sewer force mains due to levee construction.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Table ES-4. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
3.16 Visual Resources													
Phase 2 Impact 3.16-1: Alter views of the SBSP Restoration Project Area.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
3.17 Greenhouse Gas Emissions													
Phase 2 Impact 3.17-1: Construction-generated GHG emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.17-2: Operational GHG emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.17-3: Conflicts with applicable GHG emissions reduction plan, policy, or regulation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:

Alternative A at each pond cluster is the No Action/No Project Alternative.

B = Beneficial; LTS = Less Than Significant; LTSM = Less Than Significant With Mitigation; NDE = No Disproportionate Effect; NI = No Impact; PS = Potentially Significant; SU = Significant and Unavoidable

The levels of significance for the impacts listed above assume that the program-level mitigation measures from the 2007 EIS/R and the elements of the Adaptive Management Plan are integral components of the Phase 2 project alternatives, and that management responses would be implemented based on ongoing monitoring and applied studies.

S.5 Environmentally Preferred Alternative

The Environmentally Preferred Alternative is defined by the Council on Environmental Quality as the alternative that best meets the criteria of Section 101(b) of NEPA (42 United States Code [USC] 4331)[1]. The environmentally preferred alternative is a NEPA term for the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment, but it also means the alternative that best protects, preserves, and enhances historical, cultural, and natural resources. The SBSP Restoration Project would provide benefits such as increased and improved tidal marshes and other habitats, additional public access and recreation opportunities, reduced risk of unplanned levee failure, and added potential for carbon sequestration. None of these benefits would be realized under the No Action Alternative.

Informed in part by the public and agency comment on the Draft EIS/R as well as ongoing monitoring and research from the AMP, the USFWS has made a preliminary identification of the Environmentally Preferred Alternative. The Phase 2 Preferred Alternative is also the Environmentally Preferred Alternative. This alternative is summarized at the end of Section S.1 above and presented in full in Chapter 6 of this Final EIS/R. As required by the regulations implementing NEPA, the USFWS will formally identify the Environmentally Preferred Alternative in its Record of Decision for Phase 2 of the project.

S.6 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6 addresses the selection of the Environmentally Superior Alternative among the alternatives proposed. That section states that, if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify and environmentally superior alternative among the other alternatives. However, as noted above, and explained in this Final EIS/R, the environmentally superior alternative is not the No Project Alternative. The SBSP Restoration Project's Phase 2 action alternatives would bring numerous benefits, none of which would be realized under the No Project Alternative.

Under the various action alternatives considered, the only potentially significant and unavoidable impacts remaining pertain to recreation and public access resources. In one of these impacts, there would be temporary closures of recreation and public access facilities during construction. In the other, the addition of less than the maximum feasible number of public access and recreation features crosses a threshold of significance established for the 2007 EIS/R. Yet even in that instance, there is still an increase in the number of public access and recreation features, but less than the maximum possible addition. These

[1] The environmentally preferred alternative is the alternative that will promote the national environmental policy expressed in NEPA (Sec. 101 (b)), as follows:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

significant and unavoidable impacts would be realized under any of the action alternatives, and one of them (failure to provide maximum possible new public access features) would be realized and of greater magnitude even under the No Action Alternative. All other potential impacts were either non-existent or less than significant. Therefore, CEQA does not require identification of an environmentally superior alternative.

Nevertheless, informed in part by the public and agency comments received on the Draft EIS/R as well as ongoing monitoring from the AMP, the SCC has made a preliminary identification of the Environmentally Superior Alternative. The Phase 2 Preferred Alternative is also the Environmentally Superior Alternative. This alternative is summarized at the end of Section S.1 above and presented in full in Chapter 6 of this Final EIS/R. Implementing the Preferred Alternative would most effectively and efficiently meet the project goals while minimizing impacts on the natural environment, the built environment, and human communities, and also comply with environmental regulatory requirements.

S.7 Areas of Controversy

CEQ Regulations for Implementing NEPA (40 CFR 1502.12) and Section 15123 of the CEQA Guidelines require that an EIS/R identify areas of controversy. In the 2007 EIS/R, the following issues were identified as being of the greatest concern:

- Potential effects on mercury bioaccumulation in the South Bay;
- Trade-offs between habitat restoration and public access/recreation opportunities;
- Trade-offs between tidal and managed pond species;
- The need to first provide flood protection in order to undertake tidal restoration in many areas;
- Availability of funding for implementation of the AMP (monitoring); and
- The potential entrainment of salmonids and estuarine fish in managed ponds, including tidally muted Pond A8.

Many of these areas were addressed by the ongoing monitoring and research projects conducted under the direction of the SBSP Restoration Project’s Science Program. The early results of those monitoring and research questions were used to develop, refine, and analyze the Phase 2 actions. For example, Section 3.5 discusses the current operations of Pond A8 and a study that is being conducted to track migrating salmonids and asses how many become entrained in the A8 Ponds. More broadly, the recognition of the need to balance restoration and recreation was a part of shaping the range of alternatives at the Mountain View Ponds and the Ravenswood Ponds, as was a similar balancing of trade-offs between tidal marsh and managed pond species.

The SBSP Restoration Project’s lead agencies, PMT, and other stakeholders use the AMP, results from the Science Program, and other established systems to incorporate new insights and observations into ongoing management actions and into the decisions about how and where to implement future restoration actions. In doing so, these entities seek to resolve these Areas of Controversy and address new ones as they develop.

As expected, the comments received during the public review period for the Draft EIS/R did identify potential areas of controversy. All comments received from SBSP Restoration Project stakeholders were tracked, considered, addressed, and responded to in Appendix R As intended, the process of responding to these comments helped focus the project's selection of a Preferred Alternative as well as adding detail to its designs and plans. Updates to the list of areas of controversy are as follows:

- Potential effects on mercury bioaccumulation in the South Bay are being tracked and addressed by the SBSP Restoration Project's Science Team and other researchers. Progress is being made in understanding the effects of project activities on mercury in water, sediments, fish, and birds. Though the issues about mercury are not completely solved, there is a growing opinion that restoration activities can proceed with caution without triggering long-term detrimental effects on water quality, biological resources, or sediment. This topic continues to be studied and tracked to inform ongoing management of Refuge ponds as to guide potential future restoration actions there.

- Trade-offs between habitat restoration and public access/recreation opportunities remains an important and challenging issue to balance. The Phase 2 Preferred Alternative includes several new public access and recreation features at the Ravenswood Ponds and at the Alviso-Mountain View Ponds, but some other considered features were removed from Phase 2 because of concerns about disruption to wildlife species. As always, the AMP will be used to study the effects of the existing and newly implemented public access features on wildlife and adjust management as needed, as well as to inform future project phase decisions about whether and how to add more access features.

- Trade-offs between tidal and managed pond species were explicitly included in the programmatic portion of the 2007 EIS/R, which set out the two program-level action alternatives: the 90%/10% mix of tidal marsh and managed ponds and the 50%/50% mix of those habitat types. The long-term program-level endpoint is expected to be somewhere between these "restoration bookends." Though many commenters expressed concern that pond-dependent species would be adversely affected by Phase 2's planned tidal marsh restoration actions, the work done by the Science Team and the analysis in this EIS/R indicate that bay-wide conversion of ponds to tidal marsh has not yet crossed a threshold of a significant adverse impact. Further, the full implementation of Phase 2 actions at the Don Edwards National Wildlife Refuge and the Eden Landing Ecological Reserve would bring the total area of tidal marsh restoration to just under 50% of the total project area. This topic will remain an item that needs careful balancing as future project phases and other restoration projects in the South Bay proceed.

- Provision of flood protection as a prerequisite for tidal restoration in many areas continues to be provided in project designs and planning.

- Availability of funding for implementation of the AMP (and other forms of monitoring) remains an issue that the SBSP Restoration Project's managers work hard to address.

- The potential entrainment of salmonids and estuarine fish in managed ponds, including tidally muted Pond A8 is still a question. The risk and magnitude of this effect will continue to be tracked and evaluated through implementation of the AMP.

In addition, two new areas of controversy were identified based on comments received on the Draft EIS/R.

- The question of whether to include tidal marsh restoration in Charleston Slough as part of the Phase 2 (instead of as a separate project to be undertaken by the city) was the most commented-upon aspect of the Draft EIS/R. That inclusion was initially considered because such a joint effort would reduce the financial cost, the temporary environmental impacts associated with construction, and the permanent environmental impacts of having a flood levee between two restoring marshes. It would also increase the ecological function and habitat connectivity of the two restored marshes. However, a number of regulatory agencies expressed concern about the potential effects on steelhead and other estuarine fish under Alternative Mountain View C. The increased connectivity between Stevens Creek, Pond A1 and Pond A2W were planned to provide additional nursery habitat for outmigrating steelhead and good general use habitat for other estuarine fish. However, the relocation of the water intake for the Shoreline Park sailing lake into the breach at the southwest corner of Pond A1 has potential to entrain some of these fish. Other configurations of the restoration components were considered to reduce or remove the risk to fish posed by the pump intake, but the SBSP Restoration Project eventually concluded that without a fish screen in place at the new water intake location, the effects could rise to the level of a significant impact and "take" of a species listed under the Endangered Species Act. A fish screen is likely to be a required part of this project component. However, the limited area available for the water intake would be inadequate to accommodate the enlarged size of the new intake and screen necessary to provide adequate flows to the sailing lake. That technical and logistical infeasibility combined with the very high initial capital cost and ongoing operations and maintenance costs have made it impracticable to include the fish screen for the water intake at this new location in the breach of the levee between Pond A1 and Charleston Slough. Without the water intake at the breach location, the City of Mountain View has concerns about meeting the demand for water intake for the Shoreline Park sailing lake in the case where the Mountain View Ponds were connected to Charleston Slough itself. Therefore, the Preferred Alternative does not include Charleston Slough.
- Similarly, the possible inclusion of the City of Redwood City's Bayfront Canal and Atherton Channel (BCAC) Project was a controversial area. There were several reasons for initially considering the BCAC Project. Most importantly, the close physical proximity of Ponds R5 and S5 to a substantial stormwater outflow provided a unique opportunity to achieve several important benefits at once. The residual salinity in the seasonally dry bottoms of these former ponds would have been reduced by the periodic introduction of freshwater runoff. Since brackish areas were a plentiful and natural part of the pre-development Bay re-establishing this type of habitat would have re-created some of the Bay's historic habitat diversity to the project. In addition, this element of the SBSP Restoration Project would have reduced an existing flood control problem in portions of Redwood City, Atherton, Menlo Park, and unincorporated San Mateo County. During periods of high stormwater runoff when Flood Slough is also at high tide, there is nowhere for the water to go. The temporary diversion into these ponds would not have completely eliminated this problem (because the storage capacity of the ponds is limited), but it would have reduced its frequency and severity. However, the BCAC Project is not included in the Phase 2 Preferred Alternative because a water quality monitoring and control plan for that project was not developed and approved by the San Francisco Bay Regional Water Quality Control Board and the Environmental Protection Agency in time for it to be incorporated in the ongoing

project development steps. A water quality monitoring and control plan is necessary to ensure that the water diverted into the ponds would not have undesirable impacts to the pond environment. Without the information provided by this plan, the SBSP Restoration Project cannot fully analyze the impacts of the BCAC Project and, therefore, it is not being considered for inclusion in the Preferred Alternative at Ravenswood. However, since the SBSP Restoration Project anticipates no changes to design or construction of the Ravenswood Ponds would be necessary to accommodate the BCAC Project in the future, nothing in this Phase 2 decision precludes future inclusion of the BCAC Project, as long as water quality standards are met and sufficient environmental impacts analysis and disclosure are undertaken under NEPA and CEQA.

S.8 Issues to be Resolved

CEQ Regulations for Implementing NEPA (40 CFR 1502.12) and Section 15123 of the CEQA Guidelines require that an EIS/R identify Issues to be Resolved. The SBSP Restoration Project's adaptive management approach is intended to address uncertainties regarding the restoration. Consequently, the AMP identifies applied studies that are intended to resolve key uncertainties and to provide a better understanding of how restoration actions affect environmental resources. The results of these studies and ongoing monitoring would allow for more effective achievement of restoration objectives in successive phases of Project implementation, and avoidance of potentially adverse environmental impacts.

The AMP proposes applied studies to resolve the following key uncertainties:

- Is there sufficient sediment available in the South Bay to support marsh development without causing unacceptable impacts to existing intertidal habitats?
- Can the existing number and diversity of migratory and breeding shorebirds and waterfowl be supported in a changing (reduced salt pond) habitat area?
- Can restoration actions be configured to maximize benefits to non-avian species both onsite and in adjacent waterways?
- Will mercury be mobilized into the food web of the South Bay and beyond at a greater rate than prior to restoration?
- Can invasive and nuisance species such as *Spartina alterniflora* (or the invasive Spartina hybrid), corvids and the California gull be controlled? If not, how can the impacts of these species be reduced in future phases of the Project?
- Will restoration adversely affect water quality and productivity (food web dynamics)?
- Will trails and other public access features/activities have significant negative effects on wildlife species?
- How will the SBSP Restoration Project gain support from the public now and into the future, including support for continued funding of restoration and management?

During the design and implementation of Phase 1 projects, some of these questions concerning the effectiveness and cost/benefit trade-offs of particular restoration design elements or management approaches were addressed through examination of specific restoration techniques. The results of those Phase 1 projects informed the choices of ponds to include in Phase 2 and the conceptual designs of the restoration alternatives. Similarly, updated results of those studies and implemented project actions have helped guide the selection of the Phase 2 Preferred Alternative.

As with the discussion above concerning the areas of controversy, the public comment period for the Draft EIS/R focused attention on several specific issues, some that are moving toward a clear answer and others that will continue to need additional study to be fully resolved. The comments and input received from the general public, regulatory agencies, and other stakeholders, including nearby cities and counties, special districts, businesses, and other interests were used to develop and address the list of issues that are included in this Final EIS/R.

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µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
$\mu g/m^3$	microgram(s) per cubic meter
2007 EIS/R	2007 South Bay Salt Pond Restoration Project Programmatic EIS/R
AAC	All-American Canal
AB	California Assembly Bill
ABA	Architectural Barriers Act
ABAG	Association of Bay Area Governments
AC Transit	Alameda-Contra Costa Transit District
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACWD	Alameda County Water District
ADA	Americans with Disabilities Act
Alameda CTC	Alameda County Transportation Commission
AMP	Adaptive Management Plan
APC	Alviso Planned Community
APE	Area of Potential Effect
ARWTF	Advanced Recycled Water Treatment Facility
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BART	San Francisco Bay Area Rapid Transit District
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
BMP	Best Management Practice
BO	Biological Opinion
BOD	biological oxygen demand
CAA	Clean Air Act (federal)
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAP	clean air plan
CAP	Climate Action Plan
CARB	California Air Resources Board
Cargill	Cargill Inc.
CCAA	California Clean Air Act
CCMP	Comprehensive Conservation Management Plan
CCP	Comprehensive Conservation Plan
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEQ	Council on Environmental Quality

CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CHP	California Highway Patrol
CMP	corrugated metal pipe
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COD	chemical oxygen demand
CRHR	California Register of Historical Resources
CTC	County Transportation Commission
CTR	California Toxics Rule
CWA	Clean Water Act
cy	cubic yard(s)
DARP/EA	Damage Assessment and Restoration Plan/Environmental Assessment
dBA	A-weighted decibels
DDT	dichloro-diphenyl-trichloroethane
Draft EIS/R	Draft Environmental Impact Statement/Report
DTSC	Department of Toxic Substances Control
EBRPD	East Bay Regional Park District
EEC	Environmental Education Center
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EIS/R	Environmental Impact Statement/Report
EO	Executive Order
ER-L	Effects Range–Low
ER-M	Effects Range–Median
ESA	Endangered Species Act of 1973
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIP	Federal Implementation Plan
FPPA	Farmland Protection Policy Act
FR	Federal Register
FTA	Federal Transit Administration
g C/m^2-yr	gram(s) of carbon per square meter per year
GHG	greenhouse gas
GWP	Global Warming Potential
h:v	horizontal to vertical
H_2S	hydrogen sulfide
HALS	Historic American Landscape Survey
HAP	Hazardous Air Pollutant

HCM	Highway Capacity Manual
HCP/NCCP	Habitat Conservation Plan/Natural Community Conservation Plan
HDPE	high-density polyethylene
HI	hazard index
HOV	high-occupancy vehicle
I	Interstate
ISP	Initial Stewardship Plan
K-8	kindergarten through grade 8
LOS	level of service
MACT	Maximum Achievable Control Technology
MAD	mosquito abatement district
MEI	Maximally Exposed Individual
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
mg/m^3	milligram(s) per cubic meter
MHHW	mean higher high water
MHW	mean high water
MLD	Most Likely Descendant
MMRP	Mitigation Monitoring and Reporting Program
MOA	Memorandum of Agreement
MPO	metropolitan planning organization
MPPD	Menlo Park Police Department
MS4	municipal separate storm sewer system
msl	mean sea level
MTC	Metropolitan Transportation Commission
MVLAHSD	Mountain View Los Altos High School District
N_2O	nitrous oxide
NA	not applicable
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NASA	National Aeronautics and Space Administration
NAVD88	North American Vertical Datum of 1988
NB	northbound
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESHAP	National Emissions Standards for HAPs
ng/L	nanogram(s) per liter
NGO	non-governmental organization
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOA	naturally occurring asbestos

NOAA	National Oceanic and Atmospheric Administration
NOD	Notice of Determination
NOP	Notice of Preparation
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
NWRS	National Wildlife Refuge System
O&M	operation and maintenance
O_3	ozone
OAL	Office of Administrative Law
OAP	ozone attainment plan
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
Porter-Cologne	Porter-Cologne Water Quality Control Act (California)
PM	particulate matter
PM_{10}	particulate matter with a diameter of 2.5 micrometers; respirable particulate matter
$PM_{2.5}$	particulate matter with a diameter of 10 micrometers; fine particulate matter
PMT	Project Management Team
ppb	part(s) per billion
ppm	part(s) per million
ppt	part(s) per thousand
PPV	peak particle velocity
QAP	Quality Assurance Plan
R&D	research and development
RCFD	Redwood City Fire Department
RCP	reinforced concrete pipe
RCPD	Redwood City Police Department
RCSD	Ravenswood City School District
Refuge	Don Edwards San Francisco Bay National Wildlife Refuge
RMP	Regional Monitoring Program
RMS	root mean square
ROD	Record of Decision
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board (San Francisco Bay)
SAFER Bay	Strategy to Advance Flood Protection, Ecosystems and Recreation along the Bay
SamTrans	San Mateo County Transit District
SB	California Senate Bill
SB	southbound

SBSP	South Bay Salt Pond
SBWR	South Bay Water Recycling
SCC	California State Coastal Conservancy
SCS	Sustainable Communities Strategy
SCVWD	Santa Clara Valley Water District
SENL	Single Event [Impulsive] Noise Level
SFBAAB	San Francisco Bay Area Air Basin
SFBJV	San Francisco Bay Joint Venture
SFCJPA	San Francisquito Creek Joint Powers Authority
SFEI	San Francisco Estuary Institute
SFEP	San Francisco Estuary Project
SFPUC	San Francisco Public Utilities Commission
SFRWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SHPO	California State Historic Preservation Officer
SIP	State Implementation Plan
SJFD	City of San Jose Fire Department
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMCTA	San Mateo County Transportation Authority
SO_2	sulfur dioxide
SR	State Route
std.	standard
SUMC	Stanford University Medical Center
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TDS	total dissolved solids
Tg	teragram(s) (million metric tons)
TMDL	Total Maximum Daily Load
tpy	ton(s) per year
TSS	total suspended solids
U.S. 101	U.S. Highway 101
UGB	Urban Growth Boundary
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCS	Verified Carbon Standard
VdB	vibration decibel(s)
VMT	vehicle miles traveled
VTA	Santa Clara Valley Transportation Authority

WPCP	Waller Pollution Control Plant
WSIP	Water System Improvement Project
WUS	non-wetland waters of the United States

1. INTRODUCTION

Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project is a collaborative effort among federal, state, and local agencies working with scientists and the public to develop and implement project-level plans and designs for habitat restoration, flood management, and wildlife-oriented public access. The Project Area is mostly within portions of the former Cargill Inc. (Cargill) salt ponds in South San Francisco Bay (Bay), which were acquired by the USFWS and CDFW in 2003. The former salt ponds included in this Final Environmental Impact Statement/Environmental Impact Report (EIS/R) are part of the United States Fish and Wildlife Service (USFWS)-owned and managed Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), and cover approximately 9,600 acres in the South Bay. The Refuge ponds in Phase 2 are collectively nearly 2,400 acres in size.

This Final EIS/R was prepared by the USFWS and the California State Coastal Conservancy (SCC), partnering with the California Department of Fish and Wildlife (CDFW), formerly the California Department of Fish and Game (CDFG); the United States Army Corps of Engineers (USACE), the Santa Clara Valley Water District (SCVWD), the City of Mountain View, the City of Redwood City, and others to evaluate the potential environmental impacts of the proposed South Bay Salt Pond (SBSP) Restoration Project, Phase 2.

This Final EIS/R provides a project-level evaluation and analysis of the SBSP Restoration Project, Phase 2 (this document is referred to throughout as the “Final EIS/R”; its public draft version is referred to as the “Draft EIS/R”). The 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R) (USFWS and CDFG 2007) analyzed the larger, program-wide details of the SBSP Restoration Project and also included a full project-level analysis for the Phase 1 actions. Where feasible and appropriate, this Final EIS/R uses information and analysis from the 2007 EIS/R for analysis of the project-level impacts of the SBSP Restoration Project, Phase 2.

1.1 Overview of the SBSP Restoration Project

The SBSP Restoration Project is a multi-agency effort to restore tidal marsh habitat, reconfigure managed pond habitat, maintain or improve flood protection, and provide recreation opportunities and public access in 15,100 acres of former salt-evaporation ponds purchased from and donated by Cargill in 2003.[1] Immediately after the March 2003 acquisition and subsequent transfer of those ponds from Cargill, the landowners, USWFS and CDFW, began implementation of the Initial Stewardship Plan (ISP) (USFWS and CDFG 2003), which was designed to maintain open water and unvegetated pond habitats with enough water circulation to preclude salt production and maintain habitat values and conditions until long-term restoration actions of the SBSP Restoration Project are implemented. The longer-term planning effort involves a 50-year programmatic-level plan for restoration, flood protection, and public access. This effort has already seen the implementation of Phase 1 projects, which are described in the 2007 EIS/R. That longer-term planning was facilitated by the SCC and was completed in January 2009. It was

[1] The former salt-production ponds are no longer used for that purpose, and, in many cases, they are no more saline than San Francisco Bay itself. Some are only seasonal ponds that are filled by rainfall, and others have been opened to tidal flows by previous actions and are no longer ponds. However, for consistency with previous documents associated with the SBSP Restoration Project, this Final EIS/R has retained the convention of referring to them as “salt ponds” or “ponds”. These are not to be confused with actual salt evaporation ponds still being operated by Cargill.

through that planning process that the SBSP Restoration Project created the projects goals and objectives that are discussed further under Section 1.2.1, Purpose and Objectives. These goals and objectives continue to guide the project to the present day.

The decision-making and management structure for the SBSP Restoration Project involves a network of partnerships between public agencies, private organizations, environmental advocates, and the public. The Project Management Team (PMT) provides the day-to-day leadership and management for the project and oversees adaptive management planning and implementation; fundraising; dispute resolution; and outreach to the public, stakeholders, and regulatory and other government agencies. The membership on the PMT consists of representatives from the SCC, the landowning agencies (USFWS and CDFW), local flood protection agencies (SCVWD and the Alameda County Flood Control and Water Conservation District [ACFCWCD]), the East Bay Regional Park District (EBRPD), and the United States Geological Survey (USGS) (the USGS representative serves as the project's Lead Scientist). The Lead Scientist facilitates ongoing communication between scientists working on relevant research and ensures scientific outputs are incorporated into PMT decision making as much as possible. An Executive Project Manager coordinates and leads the PMT. A representative from the Center for Collaborative Policy also participates in the PMT meetings to maintain ongoing outreach efforts, including those for the project's Stakeholder Forum. The Stakeholder Forum consists of invited representatives from agencies, nonprofit organizations, local business organizations, and elected officials. The Stakeholder Forum advises the PMT on proposed project decisions and represents the project within their communities. The San Francisco Estuary Institute created and maintains the project's website at www.southbayrestoration.org to provide outreach on events, updates on the project status, and presentations on scientific research that is relevant to project. The PMT has met monthly since its inception in 2003.

The planning phase of the SBSP Restoration Project was completed in January 2009 with the publication of the final 2007 EIS/R. Phase 1 implementation in the Refuge began immediately and was completed in until December 2014. Phase 1 involved the construction of 3,040 acres of tidal or muted tidal wetlands, 710 acres of enhanced managed ponds, 7 miles of new public access trails, and habitat islands and improved levees.[2] The selection of and planning for the Phase 2 projects started in 2010 and continues with this Final EIS/R. The ponds that were not part of Phase 1, nor planned to be part of Phase 2, will continue to be actively managed according to the goals set forth in the Initial Stewardship Plan until further implementation planning and the appropriate adaptive management studies are completed.

The following sections describe the goals, objectives, and planning approach set forth in the 2007 EIS/R; how they were used to select Phase 1 projects, and how these principles continued to guide the project with the selection of the Phase 2 projects.

1.2 Purpose and Need

The Phase 2 actions described in this Final EIS/R tier from the 2007 EIS/R for the SBSP Restoration Project and consist of project-level implementation of the SBSP Restoration Project for some areas of the Refuge. Phase 2 also includes options for incorporating some non-Refuge areas into the project planning

[2] The SBSP Restoration Project refers to all former salt pond levees as "levees" even though they were not designed or constructed to perform as true flood protection levees. They are largely earthen berms intended to isolate water for salt production. In keeping with this project's established terminology, this Final EIS/R maintains the term "levees" throughout.

and design, though collaboration with the cities and private entities that own those areas (more detail on this is in Section 1.5, below). Phase 2 would implement actions to move toward achieving the overall purpose and need, goal, and objectives developed for the SBSP Restoration Project as a whole. The purpose and need, goal, and objectives were developed for the 2007 EIS/R by the SBSP PMT with input from the Stakeholder Forum, Science Team, and Regulatory and Trustee Agency Group. As such, Phase 2 has the same purpose and need, goal, and objectives as the SBSP Restoration Project as a whole.

The goal, objectives, and purpose and need are discussed in the following sections.

1.2.1 Goal and Objectives

The overarching Goal and six Objectives developed for the SBSP Restoration Project, which were adopted by the SBSP Restoration Project Stakeholder Forum on February 18, 2004, and presented in the 2007 EIS/R, apply to Phase 2.

Goal

The Goal of Phase 2 of the SBSP Restoration Project is the restoration and enhancement of wetlands in South San Francisco Bay while providing for flood management and wildlife-oriented public access and recreation.

Objectives

The Objectives of Phase 2 of the SBSP Restoration Project are:

1. Create, restore, or enhance habitats of sufficient size, function, and appropriate structure to:
   - Promote restoration of native special-status plants and animals that depend on South San Francisco Bay habitat for all or part of their life cycles.
   - Maintain current migratory bird species that utilize existing salt ponds and associated structures such as levees.
   - Support increased abundance and diversity of native species in various South San Francisco Bay aquatic and terrestrial ecosystem components, including plants, invertebrates, fish, mammals, birds, reptiles, and amphibians.
2. Maintain or improve existing levels of flood protection in the South Bay.
3. Provide public access and recreational opportunities compatible with wildlife and habitat goals.
4. Protect or improve existing levels of water and sediment quality in the South Bay and take into account ecological risks caused by restoration.
5. Implement design and management measures to maintain or improve current levels of vector management, control predation on special-status species, and manage the spread of non-native invasive species.
6. Protect the services provided by existing infrastructure (e.g., power lines, railroads).

1.2.2 Purpose and Need for Action

The SBSP Restoration Project is needed to address the following:

- Historic losses of tidal marsh ecosystems and habitats in San Francisco Bay and concomitant declines in populations of endangered species (e.g., Ridgway's rail [(*Rallus obsoletus obsoletus*; formerly California clapper rail)], salt marsh harvest mouse [*Reithrodontomys raviventris*]);
- Increasing salinity and declining ecological value in several of the ponds within the project area;
- Long-term deterioration of non-certifiable levees (for Federal Emergency Management Agency [FEMA] purposes) within the project area, which could lead to levee breaches and flooding;
- Long-term tidal flood protection; and
- Limited opportunities in South San Francisco Bay for wildlife-oriented recreation.

The purpose of the SBSP Restoration Project is to meet the needs described above through implementing various alternatives to restore tidal marsh habitat, reconfigure managed pond habitat, maintain flood protection, and provide recreation opportunities and public access.

1.2.3 Restoration

The 2007 EIS/R describes a mix of tidal habitat and managed pond habitat restoration intended to balance the trade-offs between several of the project's ecological goals and objectives. The 2007 EIS/R stated that the project's preferred alternative was Programmatic Alternative C, which would restore up to 90 percent of the project's ponds to tidal wetlands, in phases, through an adaptive management framework. Programmatic Alternative B would have set a target at 50 percent tidal marsh and 50 percent enhanced managed ponds. In choosing Programmatic Alternative C, the PMT left itself flexibility to work towards that end goal while still acknowledging that the 50/50 balance from Alternative B and the 90/10 balance from Alternative C represented "bookends" of what the long-term restoration outcomes would be and that the actual stopping point of restoration would likely be somewhere between these extremes.

Although restoration of tidal habitat would benefit special-status and native species (Project Objective 1a), enhancement of managed pond habitats would help maintain the migratory bird species using the existing ponds (Project Objective 1b). Both habitat types would support an increased abundance and diversity of the native species of the South Bay (Project Objective 1c). The project's success in balancing these objectives will be evaluated through the Adaptive Management Plan (AMP), which not only helps the ongoing and short-term management actions and decisions of the project ponds but also helps determine future restoration targets for each of the ponds to balance tidal marsh restoration with enhancement of managed ponds and the eventual stopping point between the 50/50 and 90/10 bookends described above. Successfully balancing the types of restoration actions means that the project can continue to restore tidal marsh in subsequent phases without undesired impacts to the environment.

Other planning considerations that supported the project's objectives were taken into account. Tidal marsh restoration projects were located where they would eventually create a continuous band of tidal marsh (a "tidal marsh corridor") along the edge of the Bay to provide connectivity of habitat for tidal-marsh-dependent species, particularly the Ridgway's rail and the salt marsh harvest mouse. Also, areas adjacent to the major sloughs that serve as migration corridors for anadromous fish were identified as a high priority for tidal restoration. Where possible, the project seeks to restore broad tidal areas protected from human and predator access.

As an adaptation to future sea level rise, the project is proposing the creation of habitat transition zones as part of Phase 2 actions. Habitat transition zones involve the beneficial reuse of material to create transitional habitats from the pond or marsh bottom to the adjacent upland habitat along portions of the upland edge. These “habitat transition zones”, are sometimes referred to elsewhere as “upland transition zones,” “transition zone habitats,” “ecotones,” or “horizontal levees”; this document uses “habitat transition zones” for these constructed features. Transition zones are specifically called out in documents such as the U.S. Fish and Wildlife Service’s Tidal Marsh Recovery Plan and the recent Science Update to the Baylands Ecosystem Habitat Goals Project Report. A gradual transition from submerged Baylands, ponds, or open waters to uplands is largely missing in the current landscape of the South Bay, where there is often an abrupt boundary between the bay or ponds and the built environment. The SBSP Restoration Project’s intention in including habitat transition zones in the Phase 2 alternatives is to restore this missing habitat feature. Doing so would:

1. Establish areas in which terrestrial marsh species can take refuge during high tides and storm events, thereby reducing their vulnerability.
2. Expand habitat for a variety of special status plant species that occupy this specific elevation zone.
3. Provide space for marshes to migrate upslope over time as sea-level rise occurs.

Before proposing these features, the SBSP Restoration Project examined the landscape to see if there are any areas adjacent to the project site where this could occur naturally. In general, the best locations for building these features would be located adjacent to open space or park land where the project can provide an even greater extent of transition into upland habitats.

However, at the edge of the Bay, these open space areas are largely former (now closed and capped) landfills which present a variety of challenges for creating the missing upland habitat. First, the existing elevation gradient between the restored marsh and the edge of the landfill is usually too steep to provide a gradual transition. Secondly, these landfills would otherwise pose a water quality risk from erosion if tidal action were introduced immediately adjacent to the protective clay liner or un-engineered rip rap slopes. In these instances, it is necessary that the project place material inside the former salt ponds to create the desired slope (15:1 to 30:1). At other locations, the actual elevations landward of the project sites are too low to create an uphill slope with the desired habitat functions. Therefore, once new levees are built to protect that area from tidal flooding, the only area remaining to build the transition zones is into the salt ponds. Finally, most of the adjacent property is not within the SBSP Restoration Project’s ability to acquire, whether or not it has the desired elevation profile, because it is currently developed. In addition to being very expensive to acquire these areas, it would be infeasible to relocate all of the residences and businesses that have been built adjacent to the salt ponds.

For these reasons, the project plans to use fill from upland excavation projects to create habitat transition zones inside the former salt ponds. The transition zones would improve the habitat quality of the restored marsh, particularly for endangered and threatened species, and improve resiliency of the shoreline over time as sea levels rise.

The approach to enhancing the managed ponds was to reconfigure the former salt production ponds to provide many of the ecological benefits, though in a smaller footprint, by providing enhanced water flows, pond depth, and salinity regimes for target species, especially migratory shorebirds and waterfowl, but also nesting terns and shorebirds. The creation of roosting and nesting islands was identified as part of pond enhancement. The reconfigured managed ponds would be located in accessible areas to provide for ease of operations and maintenance (O&M) and dispersed so they are readily available to birds traveling between the ponds and other habitats throughout the South Bay. The project expects to rely on gravity-flow structures as much as possible to minimize the costs of pumping while providing adequate pond habitat to support high densities of birds. Ponds near interpretive opportunities, such as the historical salt works, are to be managed as appropriate to preserve the historic resources of interest.

1.2.4 Flood Management

The second goal of the SBSP Restoration Project is (and also Project Objective 2) “to maintain or improve existing levels of flood protection in the South Bay Area”. The project and adjacent areas are in low-lying Bay shoreline that could be vulnerable to coastal flooding from storms and sea-level rise. Recognizing that the changing hydrology in these areas requires the expertise and funding available from local flood protection agencies, the SBSP Restoration Project’s management team invited these agencies to join the planning team early in the process. The approach to managing flood risks with tidal restoration projects was to locate the projects in areas where they would not increase the existing flood risk; in addition, existing levees were to be improved to provide increased, if still limited, protection or to raise existing high-ground areas with fill. In areas where this approach was not sufficient, the project sought to work with local flood protection agencies to implement the appropriate flood protection measures to protect adjacent areas and allow for tidal and other habitat restoration.

In Santa Clara County, the SBSP Restoration Project is currently working with USACE and SCVWD to complete and implement the South Bay Shoreline Study (Shoreline Study), the first portion of which is intended to protect areas adjacent to the community of Alviso, within the City of San Jose (near Ponds A9 through A18). A representative from USACE participates in the PMT meetings as a liaison between the Shoreline Study and the SBSP Restoration Project to ensure coordination between the two projects. In San Mateo County, the project is coordinating with the Strategy to Advance Flood Protection, Ecosystems and Recreation along the Bay (SAFER Bay) project, an effort led by the San Francisquito Creek Joint Powers Authority to provide needed fluvial and coastal flood protection in San Mateo County. In Alameda County, the SBSP Restoration Project is working with ACFCWCD to address flood risks at Eden Landing. See Section 1.2.8, Phase 2 Planning Process, which provides details about why efforts to plan and obtain environmental clearance for Phase 2 actions at Eden Landing are being conducted separately from those in Santa Clara County and San Mateo County.

1.2.5 Recreation and Public Access

To meet the third goal and Project Objective 3 (“provide public access and recreation opportunities compatible with wildlife and habitat goals”), the SBSP Restoration Project incorporates public access features into project design. The 2007 EIS/R describes actions to complete the missing segments of the Bay Trail spine, to create new spur trails, and to provide interpretive signage and guided or self-guided walks to cultural features and interpretive stations at strategic locations along the trail network. These stations would be of varying sizes and scope and may include interactive features that can operate independently or be enhanced with the assistance of docents. Viewing platforms were recommended at vista points with interpretive panels or signage to link the viewer with the site location. Altogether, these public access and recreation features should provide increases in high-quality, varied aesthetic experiences and encourage recreation for greater numbers and varieties of visitors.

Where levees are improved or proposed, trails are to be integrated with the levee structure, without interrupting the flood control function. Tidal access and recreation areas are designed to withstand periodic inundation, if appropriate, and may be in locations that would have more limited access or use, depending on tidal location and habitat requirements. Research on the effects of recreation on habitat is ongoing and new information will be incorporated into the adaptive management process. Access points are designed to be as barrier-free as possible to provide access for visitors of varying abilities and to comply with the Americans with Disabilities Act (ADA). The designs consider city and county standards and would strive to harmonize with existing facilities.

1.2.6 Adaptive Management

The 2007 EIS/R acknowledged that significant uncertainties remain with the project because of its geographic and temporal scale. To address these uncertainties, the project was planned to be carefully implemented in phases, with learning from the results incorporated into management and planning decisions. This adaptive management approach is described in the AMP (Appendix D of the 2007 EIS/R), which is a comprehensive plan and program to generate information (applied studies, monitoring, and research) that the PMT can use to make decisions about both current management of the project area and future restoration actions to meet project objectives and avoid harmful impacts to the environment.

Adaptive management is essential to keeping the project on track to meet its objectives, and adaptive management was the primary tool that the 2007 EIS/R identified for avoiding significant impacts to the environment. Without adaptive management (and its associated information collection), the PMT would not understand the restored system and would not be able to explain its management actions to the public. Furthermore, responses to unanticipated changes would be based on guesswork, which could exacerbate problems. For these reasons, adaptive management is integral to the project, and construction projects are expected to feature applied studies, as called for in the AMP, so that the PMT can learn from project implementation.

Although the preferred alternative in the 2007 EIS/R was Programmatic Alternative C, which would restore up to 90 percent of the project's ponds to tidal wetlands in phases, the document also states that if that alternative is not possible without causing undesired environmental impacts, as detected through the adaptive management monitoring and applied studies, then the project would stop converting ponds to tidal wetlands. The actual amount of tidal wetlands restored at the end of the 50-year project horizon could be less than 90 percent.

Adaptive management continues to be a significant part of Phase 2. As described below, data will be collected through the AMP-guided Phase 2 project evaluation and design.

1.2.7 Phase 1 Projects

The 2007 EIS/R was not just a planning document but also included project-level analysis of several restoration, enhancement, recreation, and flood protection projects that would help fulfill the SBSP Restoration Project's goals and objectives. The selection of the Phase 1 projects considered a variety of factors. The criteria, as listed in the 2007 EIS/R, were available funding, likelihood of success, ease of implementation, visibility and accessibility, opportunities for adaptive management and applied studies, value in building support for the project, and certainty of investment.

Phase 1's restoration actions were successfully completed in December 2010; the last of the public access and recreation features were completed in April 2016. At the end of Phase 1, 1,600 acres of tidal and

1,440 acres of muted tidal habitats were opened to tidal inundation. The tidal areas already show signs of estuarine sedimentation and natural vegetative colonization. These tidal habitats will contribute to the recovery of endangered, threatened, and other special-status species; tidal-marsh-dependent species; and the recovery of South Bay fisheries. Also, 710 acres of managed ponds were constructed at a range of water depths to create a variety of depth, hydrology, and salinity regimes through the use of flow control structures, grading, and other means. In addition, approximately 7 miles of new trail were built, providing new recreational opportunities. Small habitat transition zones were constructed in Eden Landing Pond E14 and vegetated with native upland species by volunteers. Islands were constructed in Ponds SF2, A16, and E12 and E13.

1.2.8 Phase 2 Planning Process

In 2010, the PMT kicked off Phase 2 planning with a design charrette. The PMT confirmed that the project objectives had not changed from those stated in the 2007 EIS/R. The primary evaluation criteria used were similar to those used in Phase 1 project selection: likelihood of progress toward project objectives, opportunities for resolving adaptive management uncertainties, value in continuing to build support for the project, readiness to proceed, and dependency on precedent actions. The last criterion was added because the PMT recognized that with the completion of Phase 1 projects, subsequent project phases were increasingly likely to require completion of other projects or adaptive management studies before SBSP Restoration Project actions could occur. For example, in some areas, proposed flood protection projects needed to be completed to provide sufficient flood protection before ponds were opened to tidal action. Or, in other areas, additional data were needed to assess the long-term response of species occupying a particular pond to changes in the project area before a pond could be opened to the tides. The secondary criteria considered were visibility and accessibility, availability of funding, and balance (meaning both a geographic balance of project locations and a balance between the project goals of restoration, public access, and flood protection). Again, the balance criterion was added to Phase 2 because as more projects are completed, it will require more of the PMT's attention to maintain the geographical balance and the project purpose balance when selecting projects.

The design charrette created a list of initial options that was presented to the Stakeholder Forum, regulatory agencies, and interested parties in 2010. A report on that Phase 2 charrette is provided as Appendix P to this Final EIS/R. After the initial feedback on the design charrette, the PMT proceeded to hire a professional environmental services firm to undertake the required technical analysis of the project elements. The initial project elements included restoration, public access, and flood protection actions in all three pond complexes: Alviso, Ravenswood, and Eden Landing.[3] However, early in the design process the PMT realized that the proposed alternatives for Eden Landing would take significantly longer to develop and analyze and that a separation of Phase 2 into landowner-specific design and environmental clearance processes would be necessary. The following paragraphs provide a brief explanation of this separation, after which, the discussion of the Phase 2 planning at the Refuge continues.

Phase 2 at Eden Landing

Phase 2 at Eden Landing was likely to include a large flood protection component to be developed with technical assistance from the Alameda County Flood Control and Water Conservation District. Due to the

[3] The term "pond complex" refers to each of the separate regional groups of ponds. In the SBSP Restoration Project, there are three pond complexes: Eden Landing, Alviso, and Ravenswood. These pond complexes are described in detail in Section 1.3, Phase 2 Project Location, below.

technical complexity of the Eden Landing Phase 2 project and other constraints having to do with land ownership, flood control, and funding requirements, the PMT decided to pursue those actions under a separate EIS/R process. However, that does not mean that Eden Landing was excluded from the scope of Phase 2 planning. Indeed, Eden Landing was included in the scoping processes discussed in Appendix P, and information about the ponds and restoration actions being considered for Phase 2 at Eden Landing was presented at stakeholder forums and regulatory agency meetings, as well as on the SBSP Restoration Project's website and newsletters.

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) (CEQ 2015b) and the *2014 California Environmental Quality Act (CEQA) Statute and Guidelines* (hereafter "CEQA Statute and Guidelines") (AEP 2014) for the California Environmental Quality Act (CEQA) discuss tiering an environmental analysis from program-level documents to project-level documents on the actual issues ripe for decision. Because the Eden Landing Phase 2 actions are not well defined at this time, those project components are not ripe for decision making. Separating out the Eden Landing Phase 2 actions from those at Alviso and Ravenswood is not "piecemealing" (an unacceptable practice in which projects are analyzed incrementally by parts to make the environmental impacts appear smaller to the overseeing agencies) because the three pond complexes are geographically separated and distinct and do not have substantial interactions between them. Some wildlife species may make use of two or more of these pond complexes, for example, but the complexes are otherwise quite independent. Further, actions implemented at the project area would have independent utility.

Appendix Q to this Final EIS/R includes a memorandum describing the development and screening of the conceptual alternatives for Eden Landing. It is important to note, however, that more recent hydraulic modeling done to evaluate whether those concepts would satisfy both the restoration and the flood control requirements of the project indicate that some changes to these concepts are likely to be required. While the general restoration, flood protection, and public access concepts discussed in that document will remain, the details of those conceptual alternatives are likely to be different.

The Phase 2 planning process for the Eden Landing pond complex will design and analyze potential alternatives for the entirety of southern Eden Landing (everything between the Alameda Creek Federal Flood Control Channel and Old Alameda Creek). As discussed in Appendix Q, the Phase 2 alternatives at Eden Landing are expected to include a range of restoration options including (1) full restoration to tidal marsh in a single implementation phase, (2) phased restoration to tidal marsh, and (3) restoring the outer, Bay-facing ponds to tidal marsh and retaining some or all of the interior, landward ponds as enhanced managed ponds. Options (2) and (3) would allow either a temporary or a permanent separation of these ponds to permit different types and rates of restoration, including the option to keep some of the landward ponds as enhanced managed ponds for pond-dependent wildlife species. That decision will be informed by the results of the ongoing applied science and by other wildlife responses to prior SBSP Restoration Project actions, the NEPA/CEQA process for Eden Landing itself, and outcomes of other restoration and management efforts around San Francisco Bay.

In sum, while the Phase 2 ponds and large-scale plans for all three pond complexes (Ravenswood, Alviso, and Eden Landing) were developed together, the project-level conceptual alternatives, designs, and the NEPA/CEQA documents are being developed separately. In this EIS/R, the Phase 2 actions at Eden Landing are treated as a separate project. Therefore, the potential cumulative impacts are analyzed in Chapter 4 – Cumulative Impacts. The section below describes the rest of the design process to prepare this Final EIS/R for the Phase 2 projects in the Alviso and Ravenswood ponds.

Phase 2 at the Refuge Ponds

In 2012, Opportunities and Constraints Memoranda were prepared for the suite of Stakeholder Forum-created initial options at each pond complex. The Opportunities and Constraints Memoranda re-examined the initial options to see if other innovative restorations, flood control, or recreation components could be added to the optional actions. Also, these memoranda were circulated to the PMT, and the results were discussed at the Stakeholder Forum in 2012. The proposed options were grouped together as appropriate to make multi-objective project alternatives in each pond complex. For example, at the Ravenswood pond complex, sets of public access, flood protection, pond enhancement, and tidal restoration options in Ravenswood Ponds R3, R4, R5, and S5 have become the Ravenswood Ponds Phase 2 project alternatives.

Through this outreach to the community and stakeholders, several new project elements not initially considered as part of the 2010 design charrette were developed. These included the opportunities to work with the City of Redwood City to improve protection from the fluvial flooding associated with outflows into Flood Slough (described further in Section 2.2.5, Ravenswood Ponds) and to add additional fill along the southeastern side of the levee in Pond A8S to enhance the habitat transition between the pond bottom and the adjacent upland levee (described further in Section 2.2.4, Alviso A8 Ponds). Because these project opportunities were consistent with the goals and objectives of the SBSP Restoration Project as a whole and the selection criteria within it, the PMT included these additional actions in the Phase 2 projects.

The PMT also decided to include the City of Mountain View-owned Charleston Slough in the alternatives development process. Although Charleston Slough is not part of USFWS's lands, it was identified in the 2007 EIS/R as an area for possible future incorporation into the SBSP Restoration Project and had been discussed at the 2010 charrette. (Section 2.2.3, Alviso-Mountain View Ponds, described the restoration objectives for Charleston Slough and several other actions that could be implemented.)

The project selection and refinement process has also incorporated additional outreach to other project stakeholders. In 2011, working groups for each of the three pond complexes met to discuss the proposed project actions. Annual meetings of the PMT with teams of scientists conducting monitoring and applied research studies have been held since 2011 to enhance coordination between scientists and the members of the PMT. The proposed Phase 2 actions have been discussed with the Science Team at each meeting to incorporate their feedback and to ensure that Phase 2 was considering opportunities for resolving some the key project uncertainties identified in the AMP.

In early 2013, these preliminary alternatives were evaluated for engineering feasibility. The result of this process was a set of two or three Action Alternatives and the required No Action Alternative (also referred to as a "No Project Alternative" under CEQA, but the NEPA term will be used throughout this Final EIS/R) for each of the pond complexes.

In mid-2013, work on the conceptual designs for those alternatives began. Those sets of alternatives were presented at a public scoping meeting in September 2013 and to the Stakeholder Forum later that fall. The public comments from the public scoping meeting were presented as Appendix A, Scoping Comments, to the Draft EIS/R. The Draft EIS/R's Appendix B, Alternatives Analysis, explains in detail the processes by which the alternatives were developed, screened, modified, and ultimately selected for inclusion in the Draft EIS/R. The impact analyses for the alternatives that are included in the Draft EIS/R began in October of 2013. In July of 2015, the Draft EIS/R was released, and the public review and comment period was extended beyond its initial 60 days (July 24-September 22, 2015) to October 30, 2015.

Revisions to the document and responses to comments began in November 2015. Those comments and the responses to them are provided as Appendix R to this Final EIS/R.

1.3 Phase 2 Project Location

The SBSP Restoration Project is in South San Francisco Bay in Northern California (see Figure 2-1). The portions of the SBSP Restoration Project covered in this Final EIS/R (i.e., Phase 2) consist of parts of two complexes of salt ponds and adjacent habitats in the South Bay that USFWS acquired from Cargill in 2003. The salt pond complexes consist of the 8,000-acre Alviso pond complex and the 1,600-acre Ravenswood pond complex, both of which are owned and managed by USFWS as part of the Refuge (see Figure 2-2). As explained above, Phase 2 actions are also being planned for implementation at the Eden Landing pond complex, which is owned and managed by the CDFW as part of the Eden Landing Ecological Reserve. Those project actions are being analyzed under a separate NEPA/CEQA compliance process.

The Alviso pond complex consists of 25 ponds on the shores of the South Bay in Fremont, San Jose, Sunnyvale, and Mountain View, within Santa Clara and Alameda Counties. The pond complex is bordered on the west by the Palo Alto Baylands Park and Nature Preserve and the City of Mountain View’s Charleston Slough; on the south by commercial and industrial land uses, Mountain View’s Shoreline Park, the National Aeronautics and Space Administration (NASA) Ames Research Center, and Sunnyvale Baylands Park; and on the east by Coyote Creek in San Jose and Cushing Parkway in Fremont.

The Phase 2 project actions in the Alviso pond complex focus on three clusters of ponds. The first cluster, containing Ponds A19, A20, and A21, is referred to as the Alviso-Island Ponds (or the Island Ponds) and is between Coyote Creek and Mud Slough near the eastern end of the Alviso pond complex. The Island Ponds were breached in 2006 as part of tidal marsh restoration actions covered by the Initial Stewardship Plan.

The second cluster, containing Ponds A1 and A2W, is referred to as the Alviso-Mountain View Ponds (or the Mountain View Ponds), is on the western edge of the Alviso pond complex. The City of Mountain View lies immediately to the south, and the Charleston Slough and the Palo Alto Flood Control Basin lie to the west.

The third cluster, containing Ponds A8 and A8S, is referred to as the Alviso-A8 Ponds (or the A8 Ponds) and is in the southern central portion of the Alviso pond complex. The A8 Ponds are west of the town of Alviso, north of Sunnyvale and State Route (SR) 237, and east of other parts of the Alviso pond complex. Ponds A8 and A8S were also included in the Phase 1 work; they were made reversibly tidal through the installation of a variable-size and reversible “notched” gate that opened in July 2010.

The Ravenswood pond complex consists of seven ponds on the bay side of the Peninsula, both north and south of SR 84, west of the Dumbarton Bridge, and on the bay side of the developed areas of the City of Menlo Park in San Mateo County. Bayfront Park in Menlo Park is directly west of the Ravenswood pond complex, and a portion of SR 84 and the Dumbarton rail corridor are along its southern border. The Phase 2 project actions in the Ravenswood pond complex are focused on the pond cluster that contains Ponds R3, R4, R5, and S5, here referred to as the Ravenswood Ponds.

1.4 NEPA and CEQA Overview

This Final EIS/R was prepared in accordance with the CEQ regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508) (CEQ 2015a, 2015b) and CEQA (Public Resources Code Section 21000 et seq.) (AEP 2014). The USFWS is the lead agency under NEPA. The SCC is the lead agency under CEQA.

In the 2007 EIS/R for the SBSP Restoration Project (USFWS and CDFG 2007), USACE and NASA were cooperating agencies [4] under NEPA; however, because NASA's involvement is limited to activities adjacent to the NASA Ames Research Center, that agency has not been involved in Phase 2 planning. Responsible agencies [5] under CEQA include CDFW, the San Francisco Bay Regional Water Quality Control Board (RWQCB), ACFCWCD, SCVWD, the California State Lands Commission, the San Francisco Bay Conservation and Development Commission (BCDC), the City of Mountain View, the City of Redwood City, and the City of Menlo Park. The California Department of Transportation may also be a responsible agency if its ownership or rights-of-way are involved in the restoration. The California State Lands Commission is also a trustee agency.

A Regulatory and Trustee Agency Group formed for the program provides ongoing support to the regulatory agencies. This group includes staff of federal, state, local, and other regulatory agencies that provide endangered species recovery guidance and permitting authority for the SBSP Restoration Project.

USFWS, SCC, and CDFW jointly manage Phase 2 of the SBSP Restoration Project in collaboration with USGS, EBRPD, ACFCWCD, and SCVWD. Together, these agencies form the SBSP Restoration Project's PMT.

1.4.1 Purpose of the EIS/R

This Final EIS/R is intended to provide the public and the cooperating, responsible, and trustee agencies with information about the potential environmental effects of the SBSP Restoration Project, Phase 2. It will be used by the lead agencies when considering approval of the project.

The CEQ regulations for implementing NEPA (40 CFR 1502.1) state that

> "the primary purpose of an [EIS] is to serve as an action-forcing device to ensure that the policies and goals defined in [NEPA] are infused into the ongoing programs and actions of the federal government. An EIS shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

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[4] According to Section 1501.6 of the CEQ Regulations, "Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition any other Federal agency which has special expertise with respect to any environmental issue, which should be addressed in the statement may be a cooperating agency upon request of the lead agency. An agency may request the lead agency to designate it a cooperating agency."

[5] Responsible agencies is defined in Section 15381 of the CEQA Guidelines as "a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration…[it] includes all public agencies other than the Lead Agency which have discretionary approval power over the project." It includes both state and local agencies that issue permits or provide funding.

CEQA Section 21002.1 states that the purpose of an EIR is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided.

Both NEPA and CEQA encourage the preparation of combined environmental planning documents.

1.4.2 Joint EIS/R

This document is a joint EIS/R. As noted above, NEPA and CEQA have similar purposes and thus use generally similar concepts and terminologies. In some cases, different terms are used to convey the same meaning. Examples of these differences in terminologies are shown in Table 1-1. This joint EIS/R primarily uses CEQA terminology; however, many NEPA terms are also used.

Table 1-1 Terms Used in NEPA and CEQA Documents

NEPA TERM	CEQA TERM
Action	Project
Lead Agency	Lead Agency
Cooperating Agency	Responsible Agency
Notice of Intent	Notice of Preparation
Environmental Impact Statement	Environmental Impact Report
Record of Decision	Findings
Purpose and Need for Action	Objectives of the Project
Affected Environment	Environmental Setting
Environmental Consequences	Impacts Analysis and Mitigation Measures
Effect	Impact
Historic Property	Historical Resource

1.4.3 Tiering from a Programmatic Joint Document

Both NEPA and CEQA guidelines have generally the same definition for tiering, which refers to the coverage of general matters in a broader Environmental Impact Statement (EIS) or Environmental Impact Report (EIR), with subsequent narrower or ultimately site-specific EISs or EIRs incorporating by reference the general discussions and concentrating solely on the issues specific to the proposed project. NEPA and CEQA encourage agencies to tier the environmental analyses for separate, but related, projects to reduce repetition.

Tiering is appropriate when the sequence of analysis follows from an EIS or EIR prepared for a program to an environmental document for an action or project of lesser scope, as is anticipated for the subsequent phases of the proposed SBSP Restoration Project. The SBSP Restoration Project is being implemented in a series of phases over many years, on the order of several decades. The 2007 EIS/R covered the long-term and larger geographic-scale components of the project (i.e., the programmatic components). Therefore, this project-level tiered EIS/R tiers off the 2007 EIS/R for the SBSP Restoration Project as a whole. Each subsequent phase will require a separate project-level NEPA/CEQA impact analysis.

NEPA

The CEQ regulations for implementing NEPA address the concept of program- and project-level impact analysis in their definition of “tiering” (43 Federal Register [FR] 56003 Section 1508.28). According to the CEQ regulations, “tiering” refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basin-wide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. Tiering is appropriate when the sequence of statements or analyses is:

> (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.
>
> (b) From an environmental impact statement on a specific action at an early stage (such as need and site selection) to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe.” (43 FR 56003 Section 1508.28)

CEQA

Similarly, the *2014 California Environmental Quality Act (CEQA) Statute and Guidelines* discusses tiering (AEP 2014); Section 15385 provides the following definition for tiering:

> “‘Tiering’ refers to the coverage of general matters in broader EIRs … with subsequent narrower EIRs or ultimately site-specific EIRs incorporating by reference the general discussions and concentrating solely on the issues specific to the EIR subsequently prepared.”

Tiering is appropriate when the sequence of EIRs is:

> (a) From a general plan, policy, or program EIR to a program, plan, or policy EIR of lesser scope or to a site-specific EIR;
>
> (b) From an EIR on a specific action at an early stage to a subsequent EIR or a supplement to an EIR at a later stage. Tiering in such cases is appropriate when it helps the Lead Agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe.

1.4.4 EIS/R Format

This document is a project-level tiered EIS/R, which examines the environmental impacts of the specifics of the Phase 2 alternatives, including construction and operation. This Final EIS/R specifically considers whether Phase 2 alternatives would result in new significant impacts not identified in the 2007 EIS/R or if the Phase 2 alternatives would cause a substantial increase in the severity of previously identified impacts. This Final EIS/R also discusses any pertinent new information or changes in circumstances that could result in new significant impacts not identified in the 2007 EIS/R or a substantial increase in the severity of previously identified significant impacts.

Previous mitigation measures identified in the 2007 EIS/R are described in Section 2.3, General Mitigation Measures from the 2007 EIS/R, and would be implemented where relevant to Phase 2 alternatives. These mitigation measures have been revised or augmented as appropriate for Phase 2 actions. This Final EIS/R also identifies whether new mitigation measures are required.

1.4.5 Environmental Review Process

Scoping

Scoping, or early consultation with persons or organizations concerned with the environmental effects of a project, is required when preparing a joint EIS/EIR. CEQ regulations for implementing NEPA (40 CFR 1506.6) require that agencies make diligent efforts to involve the public in preparing and implementing their NEPA procedures. Pursuant to NEPA, a Notice of Intent to prepare an EIS/R for Phase 2 of the SBSP Restoration Project was published in the Federal Register on September 9, 2013. Pursuant to the 2014 CEQA Statute and Guidelines, Section 15082, a Notice of Preparation was distributed to responsible agencies and the public on September 9, 2013. These notices announced a public review period during which comments were received on the appropriate scope of the Draft EIS/R.

A public scoping meeting was held on September 24, 2013, to solicit comments on environmental issues to be addressed in the Draft EIS/R. The scoping comments received during the comment period—which extended beyond the minimum 30-day period to account for the federal government shutdown in November 2013—and additional comments received after the comment period are presented in Appendix A, Scoping Comments.

Draft EIS/R

A Notice of Availability (NOA) for the Draft EIS/R was published on July 24, 2015 in the Federal Register, advertisements were placed in several local newspapers, and the Draft EIS/R was filed with the United States Environmental Protection Agency (USEPA) for federal review in accordance with 40 CFR parts 1506.9 and 1506.10. The publication of the NOA also serves to meet CEQA requirements. Also, pursuant to the 2014 CEQA Statute and Guidelines, the Draft EIS/R, along with a Notice of Completion, was filed with the Office of Planning and Research (OPR) for state agency review. USFWS and the SCC sent notices to all who provided scoping comments, expressed interest in this project, or requested such notice in writing. Copies of the Draft EIS/R were available for public review on the SBSP Restoration Project website (www.southbayrestoration.org) and during regular office hours at the following locations:

- Visitor Center, Don Edwards San Francisco Bay National Wildlife Refuge, 2 Marshlands Road, Fremont, CA 94555, (510) 792-0222;
- California State Coastal Conservancy, 1330 Broadway, 13th Floor, Oakland, CA 94612, (510) 286-1015;
- Offices of the San Francisco District of the United States Army Corps of Engineers, 1455 Market Street, #16, San Francisco, CA 94103, (415) 503-6804; and
- Administrative offices of the Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, CA 95118-3686, (408) 265-2600.

The Draft EIS/R is also available for public review at the following libraries:

- Alviso Branch Library, 5050 N. First St., San Jose, CA 95002, (408) 263-3626.
- Biblioteca Latino America, 921 South First St., San Jose, CA 95110, (408) 294-1237
- California State University Library, 25800 Carlos Bee Blvd., Hayward, CA 94542, (510) 885-3000.
- Fremont Main Library, 2400 Stevenson Blvd., Fremont, CA 94538, (510) 745-1424.
- Menlo Park Library, 800 Alma St., Menlo Park, CA 94025, (650) 330-2500.
- Mountain View Library, 585 Franklin St., Mountain View, CA 94041, (650) 903-6337.
- Rinconada Library, 1213 Newell Rd., Palo Alto, CA 94303, (650) 329-2436.
- King Library, 150 E San Fernando St., San Jose, CA 95112, (408) 808-2000.
- Redwood City Main Library, 1044 Middlefield Road, Redwood City, CA 94063, (650) 780-7018;
- San Mateo County East Palo Alto Library, 2415 University Ave., East Palo Alto, CA 94303, (650) 321-7712.
- Santa Clara County Milpitas Library, 160 N Main St., Milpitas, CA 95035, (408) 262-1171.
- Santa Clara Public Library, 2635 Homestead Rd., Santa Clara, CA 95051, (408) 615-2900.
- Sunnyvale Public Library, 665 W Olive Ave., Sunnyvale, CA 94086, (408) 730-7300.
- Natural Resources Library, U.S. Department of the Interior, 1849 C Street NW, Washington, DC 20240–0001, (202) 208-5815.

The Draft EIS/R was circulated for a public and agency review period that was initially set for 60 days, beginning with the publication of that document (receipt of the Draft EIS/R from the State Clearinghouse and publication of the NOA in the Federal Register). The comment period was extended an additional 38 days, until October 30, 2015.

Final EIS/R

Following the close of the review period, work began on the Final EIS/R. The USFWS and the SCC considered all comments made on the Draft EIS/R by the public and federal, state, and local agencies within the public review period. There were 312 individual comments from 35 comment letters. The comments and formal responses to them are presented as Appendix R to this document. That appendix also includes a set of master comment responses to address a number of cross-cutting topics that were commented on or asked about in multiple submissions.

This Final EIS/R was prepared to incorporate changes suggested by comments on the Draft EIS/R, as appropriate, and responds to all substantive comments received during the Draft EIS/R review period. The Final EIS/R is required to (1) provide a full and fair discussion of the proposed action’s significant environmental impacts; and (2) inform the decision-makers and the public of reasonable measures and alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. Concurrent with publication of this Final EIS/R, an NOA for the Final EIS/R was published in the Federal Register and in local newspapers. The Final EIS/R was filed with U.S. Environmental Protection Agency pursuant to 40 CFR parts1506.9 and 1506.10. The USFWS and SCC provided notices of the Final EIS/R to all who commented on the Draft EIS/R and others who had signed up for noticing. Copies of the Final EIS/R were made available for review on the SBSP Restoration Project, Phase 2, website (www.southbayrestoration.org) and at the locations listed above where the Draft EIS/R was available.

USFWS will not proceed with implementing the SBSP Restoration Project, Phase 2 any sooner than 30 days following the publication of the Final EIS/R (40 CFR part 1506.10) Under CEQA Guidelines, the Conservancy will send other agencies responses to the Draft EIS/R public comments at least 10 days prior to certification of the EIR. The comments and responses from the Draft EIS/R will be compiled and included as an appendix to the Final EIS/R.

Future Steps

Future steps will involve preparing a Record of Decision, EIR certification, and a Mitigation and Monitoring Reporting Program (under CEQA).

Record of Decision

The final step in the NEPA process is the preparation of the Record of Decision (ROD), which presents a concise summary of the decision made by USFWS. The ROD can be published immediately after the Final EIS/R comment period has ended. After the conclusion of the 30-day waiting period on the Final EIS/R, USFWS will begin to prepare the ROD regarding the SBSP Restoration Project, Phase 2. The ROD will summarize the proposed action and alternatives considered in the EIS/R, identify and discuss factors considered in the federal lead agency’s decision, and state how these considerations entered into the final decision. If appropriate, the ROD will state how Phase 2 of the SBSP Restoration Project will be implemented and describe any associated mitigation measures. Final signature of the ROD will follow.

EIR Certification

The final step in the CEQA process is certification of the EIR. In accordance with CEQA, the SCC would make one or more written findings for any significant CEQA impacts, accompanied by a brief explanation of the rationale for each finding. The findings constitute a binding set of obligations that will come into effect when the SCC approves the project. When making the findings, the lead agency must adopt a program for reporting on or monitoring the changes that it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects.

When a lead agency decides to approve a project that will result in significant unavoidable impacts (impacts that cannot be avoided or reduced to less-than-significant levels), the lead agency is required to prepare a Statement of Overriding Considerations. The statement must specify the reasons to support the lead agency’s actions based on substantial evidence in the record. According to the 2014 CEQA Statute and Guidelines, Section 15093,

> “CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits of a proposed project outweigh the unavoidable

adverse environmental effects, the adverse environmental effects may be considered 'acceptable.'"

A certified EIR indicates the following:

- The document complies with CEQA;
- The decision-making body of the lead agency reviewed and considered the Final EIR before approving the project; and
- The Final EIR reflects the lead agency's independent judgment and analysis.

Within 5 working days after approval of the project, the CEQA lead agency, the SCC, is required to file a Notice of Determination (NOD) with OPR and the Alameda, Santa Clara, and San Mateo County Clerks.

Mitigation Monitoring and Reporting Program (CEQA)

CEQA Section 21081.6(a)(1) requires lead agencies to "adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment." The Mitigation Monitoring and Reporting Program (MMRP) required by CEQA need not be included in the Final EIR. However, throughout this EIS/R, measures have been clearly identified to facilitate establishment of an MMRP. Any mitigation measures adopted as a condition of approval of the project will be included in the MMRP for Phase 2 of the SBSP Restoration Project to verify compliance.

1.5 Project Background

This section discusses the history of the South Bay tidal marsh, salt pond operations, and the Refuge. It also describes the acquisition of the former salt production ponds in 2003 and related restoration efforts in the South Bay.

1.5.1 Historic Tidal Marsh in South Bay

The San Francisco Bay Estuary was formed about 10,000 years ago, as the ocean entered the Coastal Range through the Golden Gate, and seawater began to fill the Bay. As the rise in water slowed approximately 3,000 years ago, sediments began accumulating in the shallows faster than the seas could cover them, allowing vegetation to begin to colonize and persist on the tidal mudflats along the estuarine margins (Cohen 2000; Collins and Grossinger 2004, as cited in the 2007 EIS/R). As recently as 150 years ago, the San Francisco Bay landscape was dominated by tidal marsh habitat. The open-water areas of the Bay were very nearly surrounded by broad expanses of tidal mudflats and even broader areas of tidal marsh (Goals Project 1999). However, that landscape began to undergo vast changes beginning with the earliest European settlements (Orlando et al. 2005). It is estimated that since 1800, over 80 percent of the tidal marsh habitat surrounding San Francisco Bay has been lost (Goals Project 1999). This loss equates to a loss of more than 150,000 acres of tidal marsh estuary-wide. In the South Bay, over 90 percent of the historic tidal marsh area has been lost due to conversions to salt ponds, agricultural areas, and urban developments (Foxgrover et al. 2004). Through the SBSP Restoration Project and other similar projects, that trend of loss is being reversed. Approximately 13,000 acres of tidal habitats around the Bay have been restored, and another 35,000 acres, including the acreage of the SBSP Restoration Project, are included in a restoration planning and design process.

1.5.2 Salt Pond Operations

Solar salt production through the conversion of tidal marsh areas to salt ponds began in the mid-1850s (Siegel and Bachand 2002). Early salt production efforts were small operations scattered throughout the Bay, but by 1936, the Leslie Salt Company emerged as the major player in the salt industry, consolidating the smaller companies into one large operation (EDAW 2005, as cited in 2007 EIS/R). In 1936, the Leslie Salt Company produced over 300,000 tons of salt annually on approximately 12,500 acres of salt ponds. By 1959, production had increased to 1 million tons of salt on tens of thousands of acres of salt ponds in the North and South Bay. Cargill acquired the Leslie Salt Company in 1978 and continued producing approximately 1 million tons of salt annually.

The solar salt production process takes several years, with the amount of time depending on seasonal variations in temperature, rainfall, and evaporation rates (Siegel and Bachand 2002). The process begins with the intake of Bay water into an “intake” pond, either through pumps or through a gate that opens at high tide. Once in the system, the Bay water is referred to as brine. The brine flows slowly through a series of ponds called “evaporator” or “concentrator” ponds, with salinity increasing from one pond to the next through evaporation.

When the brine becomes fully saturated with salt, the brine is pumped into “pickle” ponds for storage and then into crystallizer beds for eventual harvesting (Life Science! 2004). Within a crystallizer bed, evaporation continues and a layer of salt accumulates on the bed. This raw salt is mechanically harvested and sent to Cargill’s processing plant in Newark for further processing before it is ready for consumers. The remaining solution is an extremely saline liquid product known as bittern, which is commercially sold as a dust palliative and a de-icing product. Although much of the former Cargill salt ponds in the South Bay are targeted for restoration in Phase 2 of the SBSP Restoration Project, Cargill will continue to operate its Newark ponds and Newark and Redwood City processing plants, maintaining a production of approximately 600,000 tons of salt annually (Life Science! 2004).

1.5.3 History of the Refuge

The Don Edwards San Francisco Bay National Wildlife Refuge is the first urban national wildlife refuge established in the United States that is dedicated to preserving and enhancing wildlife habitat, protecting migratory birds, protecting threatened and endangered species, and providing opportunities for wildlife-oriented recreation and nature study for the surrounding communities. Congress created the Refuge in 1972 “…for the preservation and enhancement of highly significant habitat…for the protection of migratory waterfowl and other wildlife, including species known to be threatened with extinction, and to provide opportunity for wildlife-oriented recreation and nature study. . .” (Public Law [P.L.] 92-330, 86 Stat. 399 [June 30, 1972]). USFWS was directed by Congress to acquire up to 23,000 acres in the area depicted on a map entitled “Boundary Map, Proposed San Francisco Bay National Wildlife Refuge” dated July 1971. Between 1977 and 1988, USFWS acquired approximately 19,000 acres, by purchase, lease, or other means. Significantly, in 1979 USFWS acquired 15,347 acres from Leslie Salt (now Cargill Salt). At the time, Leslie Salt retained commercial salt-making rights on the property’s ponds in perpetuity. Also, in 1983 USFWS acquired Pond A6 from the Knapp family and The Nature Conservancy.

In 1988, Congress directed USFWS to expand the Refuge by authorizing the acquisition of an additional 20,000 acres, for a total of 43,000 acres. (P.L. 100-556, 102 Stat. 2780 [October 28, 1988]). The additional acres were to be in the vicinity of, and similar to, the land identified in the original 1972 legislation and “necessary to protect fish and wildlife purposes.” In 1990, USFWS completed an

Environmental Assessment and Finding of No Significant Impact (1990 EA) that evaluated potential acquisition of land to meet the Congressional purposes of establishing and expanding the Refuge. The 1990 EA identified what was then called the Authorized Expansion Boundary (since renamed the Approved Acquisition Boundary) on a map. (The 1990 EA and its maps are presented in Appendix P of the 2007 EIS/R The Approved Acquisition Boundary is presented as part of the Refuge's Final Comprehensive Conservation Plan published in October 2012). Since 1990, USFWS has acquired land within the Approved Acquisition Boundary (through purchase, lease, or donation), including portions of the 15,100 acres acquired from Cargill in 2003 (see discussion below). As of 2012, the Refuge consists of approximately 30,000 acres. In 1995, the Refuge was renamed Don Edwards San Francisco Bay National Wildlife Refuge to honor Congressman Don Edwards, who spearheaded the effort to establish the Refuge.

1.5.4 2003 Salt Ponds Acquisition

In October 2000, Cargill proposed to consolidate salt pond operations and transfer the land and salt production rights on 61 percent of its South Bay operation area. Negotiations headed by Senator Dianne Feinstein led to the signing of a Framework Agreement, which laid out the accord for the public acquisition of the South Bay salt ponds (including the acquisition of Cargill's salt-making rights retained on some ponds in 1979) and 1,400 additional acres of crystallizer ponds along the Napa River in the North Bay. The Framework Agreement was signed in May 2002 by the California Resources Agency, Wildlife Conservation Board, CDFG, the SCC, USFWS, Cargill, and Senator Feinstein. Additional negotiations were completed in December 2002 regarding the Phase-out Agreement, which lays out specific details regarding Cargill's responsibilities for halting salt production in the ponds in question.

The acquisition and restoration of the salt ponds has long been a goal of legislators, resource agencies, and non-governmental organizations (NGOs) working to protect San Francisco Bay. Supporters and signatories of the Framework Agreement included the San Francisco Bay Joint Venture, Save the Bay, National Audubon Society, Citizens Committee to Complete the Refuge, and many other agencies, organizations, and individuals.

The State of California approved the transfer of the salt ponds from Cargill on February 11, 2003. USFWS is now the landowner and land manager of the portions of the SBSP Restoration Project within the Refuge. Table 1-2 presents the Phase 2 ponds and their acreage. Other than the addition of Charleston Slough (which, as described below, is newly added and was not considered in the 2007 EIS/R), these acreages are the same as those presented in the 2007 EIS/R, and for consistency, these areas will be used throughout this document. Other estimates of individual ponds may appear in various documents, and these may differ because they may include the external levees instead of the internal levees, or they may have been sampled during different seasons or tidal cycles. Total areas of pond complexes or pond clusters might include uplands adjacent to them or to waterways or marshes between them. To avoid confusion, the approximate areas used in the 2007 EIS/R will be the standard in this document.

Table 1-2 Phase 2 Pond Acreage by Pond Complex

ALVISO POND COMPLEX		RAVENSWOOD POND COMPLEX	
Pond	**Acres**	**Pond**	**Acres**
A1	275	R3	270
A2W	435	R4	295
Charleston Slough	115	R5	30
A8	410	S5	30
A8S	160		
A19	265		
A20	65		
A21	150		
Total Acreage	**1,875**	**Total Acreage**	**625**
		Total Area	**2,500**

1.5.5 Restoration in South San Francisco Bay

Phase 2 of the SBSP Restoration Project is a direct outgrowth of the acquisition of the Alviso and Ravenswood pond complexes (either in fee ownership or the salt-making rights) from Cargill in 2003 and the continued implementation of the larger SBSP Restoration Project laid out in the 2007 EIS/R. The project has focused on how best to manage and restore these lands. There are also existing habitat areas just outside the SBSP Restoration Project boundary that present opportunities to work with the owners of these areas to collaborate on restoration or environmental quality efforts. Agreements have been reached with those landowners to include them in the Phase 2 designs and planning, which is why they were included in the Draft EIS/R and were considered for inclusion in the Preferred Alternatives for Phase 2 discussed in this Final EIS/R.

One such opportunity involves Charleston Slough, which is adjacent to and just west of Pond A1 in the Alviso-Mountain View pond cluster. Charleston Slough is owned by the City of Mountain View and is being included in a coordinated planning and implementation effort, along with the Phase 2 project ponds. As a pre-existing permit condition from BCDC, the City of Mountain View is obligated to create 53 acres of vegetated tidal marsh with cordgrass and pickleweed. To assist the City of Mountain View in meeting this restoration goal, one of the Phase 2 alternatives at the Mountain View pond cluster includes components that would integrate Charleston Slough into the SBSP Restoration Project and assist the City of Mountain View in meeting that BCDC permit conditions, while speeding and enhancing the restoration, flood protection, and recreation/public access improvements near those ponds. More detail on Charleston Slough is presented in Chapter 2, Alternatives, and Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of this Final EIS/R. Those chapters fully describe and analyze the proposed actions and possible environmental impacts to Charleston Slough and its surroundings and are not tiered from the 2007 EIS/R because Charleston Slough was not included in that document.

A similar opportunity exists at the western end of the Ravenswood pond complex, where collaboration between the SBSP Restoration Project and the City of Redwood City would benefit both parties and simultaneously improve habitat conditions and flood protection. Under one of the Action Alternatives at the Ravenswood pond complex, the City of Redwood City's Bayfront Canal and Atherton Channel Project would be integrated with the SBSP Restoration Project to reduce salinity in some of the enhanced managed ponds at the Ravenswood pond complex and provide temporary detention for peak stormwater runoff during heavy rainstorms. More detail on the Bayfront Canal and Atherton Channel Project is presented in Chapters 2 and 3 of this Final EIS/R, which again describes and analyses the actions and potential impacts of this opportunity without tiering from the 2007 EIS/R.

1.6 Intended Uses of the EIS/R and Required Approvals

The lead agencies will use this Final EIS/R when considering approval of the Phase 2 actions under the SBSP Restoration Project. Responsible agencies that have review and permit authority over the project will also use the Final EIS/R.

Agencies with responsibility for permit approval of certain project elements **may** include the following:

- USACE, under Section 404 of the Clean Water Act;
- USFWS and the National Marine Fisheries Service (NMFS), for Section 7 consultation pursuant to the federal Endangered Species Act regarding "take" of federally listed threatened or endangered species;
- NMFS, for Essential Fish Habitat consultation under the Magnuson-Stevens Fishery Conservation and Management Act;
- The San Francisco Bay RWQCB, for water quality certification under Section 401 of the Clean Water Act;
- The San Francisco Bay RWQCB, for a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity requiring preparation of a Storm Water Pollution Prevention Plan (SWPPP);
- BCDC, for permit and determination of conformity with the California Coastal Act, the McAteer-Petris Act, the Coastal Zone Management Act of 1972, and the San Francisco Bay Plan;
- The California State Lands Commission, for leases within its jurisdiction, including the submerged lands of the sloughs within the SBSP Restoration Project area and several small areas of state-owned land within the SBSP Restoration Project area;
- Bay Area Air Quality Management District (BAAQMD), may require permits to operate the proposed portable pumps;
- Cities with jurisdiction over the portions of the project area or access routes to it; and
- Encroachment permits from UPRR and Pacific Gas and Electric Company (PG&E).

Other required approvals include easements or modifications to existing easements from nearby landowners for proposed levees that provide flood protection and trail access.

1.7 Documents Incorporated By Reference

An EIS/R can incorporate by reference all or portions of another document that are a matter of public record or are generally available to the public (CEQ regulations for implementing NEPA [40 CFR 1502.21] and the 2014 CEQA Statute and Guidelines, Section 15150). Where all or part of another document is incorporated by reference, it has to be made available for inspection at a public place. Also, the document that is incorporated by reference must be briefly summarized or described in the EIS/R, and the relationship of the referenced document and the EIS/R shall be described.

"Incorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand" (2014 CEQA Statute and Guidelines Section 15150(f)). This statement clearly distinguishes those documents that are incorporated by reference from those that are included as appendices. Materials included as appendices to an EIS/R contribute substantively to the impacts analysis (such as modeling results).

The following documents below are incorporated by reference in this Final EIS/R.

- SBSP ISP and ISP EIR/EIS (SCH# 2003032079);
- SBSP Restoration Project Phase 2 Alternatives Analysis Report;
- SBSP Restoration Project Phase 2 Initial Opportunities and Constraints Summary Report;
- SBSP Restoration Project Hydrodynamics and Sediment Dynamics Existing Conditions Report;
- SBSP Restoration Project Levee Assessment Report;
- SBSP Restoration Project Flood Management and Infrastructure Existing Conditions Report;
- SBSP Restoration Project Water and Sediment Quality Existing Conditions Report;
- SBSP Restoration Project Biology and Habitats Existing Conditions Report;
- SBSP Restoration Project Public Access and Recreation Existing Conditions Report; and
- SBSP Restoration Project Final Cultural Resources Assessment Strategy Memorandum and Historic Context Report.

All of these documents are available for review on the SBSP Restoration Project's official website (www.southbayrestoration.org) and at the SCC's office at 1330 Broadway, 13th Floor, Oakland, CA 94612. The documents incorporated by reference are described in various chapters and sections of this Final EIS/R.

1.8 2007 EIS/R

The 2007 EIS/R evaluated a No Action Alternative and two Action Alternatives for restoring or enhancing the former salt ponds for the SBSP Restoration Project. The two Action Alternatives established a set of "bookends" for the long-term project goals. Under these bookends, Programmatic Alternative B would work toward a gradual restoration to tidal marsh of 50 percent of the total acreage in the area of the SBSP Restoration Project. The other 50 percent would be maintained or improved to enhanced managed ponds. Programmatic Alternative C would continue past the 50 percent tidal marsh restoration goal and end at 90 percent of the total area of the SBSP Restoration area being restored to tidal marsh, leaving only 10 percent in enhanced managed ponds. Alternative A is the No Action Alternative, under which no actions would have been taken.

The 2007 EIS/R evaluated the environmental impacts of these alternatives and found that Programmatic Alternative A would not meet the project purpose and need to restore tidal marshes in South San Francisco Bay. The 2007 EIS/R selected Programmatic Alternative C at that time because the SBSP Restoration Project would need many years and multiple project-level phases to even approach the 50 percent tidal marsh goal of Programmatic Alternative B. As that level of tidal marsh restoration was being approached, the PMT and other stakeholders could use the findings of the AMP and the directed scientific research questions to determine whether to stop at the 50 percent tidal marsh goal or continue toward the 90 percent goal or to some other percentage in between those bookends.

As stated in the ROD, Programmatic Alternative C was chosen as the long-term goal. However, through application of the Adaptive Management Plan, the project restoration activities could stop before reaching the full goal of 90 percent tidal marsh restoration for that alternative. The Phase 2 project alternatives evaluated in this Final EIS/R would advance the program-level goals of both Programmatic Alternatives B and C. Completing Phase 2 would move the larger project closer to the 50 percent tidal marsh/50 percent managed ponds goal of Alternative B, but it would not reach it. Thus, completing Phase 2 would still allow the project to cease restoration activities at some point between the bookends of Programmatic Alternatives B and C.

2. ALTERNATIVES

This chapter describes the alternatives analyzed in this Final Environmental Impact Statement/Report for Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project (referred to throughout as the Final EIS/R). Section 2.1, Alternative Development Process, describes the process of developing the project alternatives to meet the purpose and need and project objectives. Section 2.2, Phase 2 Project-Level Alternatives, describes the Phase 2 alternatives for the pond clusters considered in this Final EIS/R: the Alviso-Island ponds, the Alviso-Mountain View ponds, the Alviso-A8 ponds, and the Ravenswood ponds.

Section 2.3, General Mitigation Measures from the 2007 EIS/R, describes the mitigation measures from the 2007 EIS/R that are relevant to the Phase 2 alternatives and that would be incorporated into the project design of all Action Alternatives or would be important factors for the Final EIS/R impact analysis. By incorporating program-level mitigation measures into project-level designs, they become part of that project and are no longer "mitigation." For that reason, they are included here in the project descriptions for the various alternatives.

2.1 Alternative Development Process

The United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) previously completed the 2007 EIS/R for the SBSP Restoration Project. The 2007 EIS/R developed long-term, end-project "target" habitat designations for each of the ponds in the project for the two action scenarios:

- Programmatic Alternative B: a split of 50 percent (by total acreage) restoration to tidal marsh and 50 percent managed ponds; and
- Programmatic Alternative C: a split of 90 percent restoration to tidal marsh and 10 percent managed ponds.

As discussed in the 2007 EIS/R, these program-level alternatives were chosen to be bookends, between which the final balance of restoration habitat will ultimately lie. Within that context, Programmatic Alternative C was selected for implementation. Phase 2 presents a range of project-level alternatives, each of which is intended to advance the overall goals and mission of the SBSP Restoration Project.

A broad range of alternatives was considered and developed to meet the Phase 2 purpose and need and project objectives. The National Environmental Policy Act (NEPA) requires development and consideration of a range of "reasonable alternatives." The California Environmental Quality Act (CEQA) requires alternatives that would "minimize significant impacts." A set of screening criteria was developed to assist in decision making and to elaborate a reasonable range of alternatives for analysis in this Final EIS/R that would minimize significant impacts. After this set of screening criteria was applied, several Action Alternatives were selected for detailed evaluation, and several alternatives were eliminated.

The alternatives for each pond cluster are not dependent on the alternatives for the other pond clusters. As such, each alternative would accomplish slightly different goals, including habitat restoration, recreation, and flood control. These restoration actions are incremental steps toward the larger programmatic goals. Decisions on the pond clusters to include in Phase 2 were based on the landowner's and the Project Management Team's (PMT's) assessment of which ponds present the best restoration opportunities that would be consistent with the SBSP Restoration Project's other goals of maintaining flood protection and providing recreational opportunities. Of the four pond clusters included in Phase 2 for the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), two would involve only modifications of earlier project actions and would not change flood risk or recreational opportunities. The other pond complexes chosen are large ponds without major infrastructure conflicts or flood-risk constraints that would provide large tracts of tidal marsh habitat and other habitats once restored.

The Action Alternatives selected for detailed evaluation are discussed in Section 2.2. See Appendix B for the Alternatives Analysis Report containing the full description of the initial alternatives, the screening criteria, the selection of alternatives to be carried into this Final EIS/R, and the alternatives considered but removed from detailed study.

2.1.1 Programmatic Context of Phase 2 Alternatives

As discussed in Chapter 1, Introduction, Phase 2 of the SBSP Restoration Project is intended to tier from the analysis conducted for the 2007 EIS/R by advancing additional restoration activities within the area of the SBSP Restoration Project. The 2007 EIS/R assessed the environmental consequences associated with two long-term restoration alternatives. In consideration of the environmental consequences discussed in the 2007 EIS/R, the USFWS Record of Decision (ROD) and the CDFW Notice of Determination (NOD) state that the USFWS and CDFW will implement Programmatic Alternative C, the Tidal Emphasis Alternative, which would eventually convert 90 percent of the former salt ponds to tidal marsh, while 10 percent would remain as enhanced managed ponds. The USFWS and CDFW will retain the option of stopping tidal marsh restoration prior to restoring 90 percent of total acreage as tidal marsh if, for example, monitoring shows that pond-dependent species appear to be adversely affected by the losses of pond habitats. In this case, the SBSP Restoration Project may shift future project phases toward enhance managed pond habitat and achieve an end result somewhere between Programmatic Alternative B and Programmatic Alternative C. Phase 2, as the second project component of this long-term restoration project, would incrementally advance the project toward these end goals.

Construction, operations, and maintenance of Phase 2 activities at one pond cluster would be independent from any activities at other Phase 2 ponds. When considering and developing the project alternatives for Phase 2, each pond cluster has been independently considered in meeting the targeted habitat designated in Programmatic Alternative C (the 90/10 alternative), and separate sets of Action Alternatives were developed for each pond cluster.

The SBSP Restoration Project has an open and lengthy history of public processes to develop alternatives that was initiated with the Stakeholder Forums in 2003. Public input from scoping meetings and public comment periods for the 2007 EIS/R and from the annual Stakeholder Forums was used to help develop these alternatives. In developing a broad range of alternatives for each pond cluster, target habitat goals, major recreation and public access goals, and flood control management issues were considered. Individual components, their variations, and intended goals were developed for each pond cluster, and these components were bundled as complete alternatives for consideration.

Larger, program-level alternatives for the SBSP Restoration Project as a whole and for the pond complexes within it were analyzed in the 2007 EIS/R. Chapter 2 of the 2007 EIS/R explained the long-term project goals, the process of developing and selecting the program-level alternatives, and the Adaptive Management Plan (AMP) that will track progress toward those goals from project-level actions and ongoing research and monitoring. The 2007 EIS/R covered the 50-year-long plan for the SBSP

Restoration Project at the programmatic level. The 2007 EIS/R also covered the Phase 1 projects at the project level.

2.1.2 Alternatives Considered But Eliminated from Further Review

A number of alternatives were initially developed and included in a screening process to refine a set of alternatives for inclusion in the Draft EIS/R and in the conceptual designs. The Alternatives Analysis Report presented as Appendix B explains these initial alternatives, the components that constitute them, and the intentions or purposes behind them. The Alternatives Analysis Report also explains the screening criteria and processes by which these alternatives were considered but eliminated from further review.

2.1.3 Adaptive Management Plan

The AMP was developed by the PMT to be an integral component of the SBSP Restoration Project. The AMP allows for lessons learned during the multiple phases of implementing the SBSP Restoration Project to be incorporated in subsequent phases as management plans and designs for future actions are updated. The AMP has created a framework for adjusting management decisions as the cause-and-effect linkages between management actions and the physical and biological responses of the system are more fully understood. The AMP also creates a management framework for the SBSP Restoration Project area to avoid irreversible adverse environmental impacts during implementation of the SBSP Restoration Project.

The AMP identifies management triggers that indicate when restoration actions may cause significant adverse environmental impacts. If a management trigger is tripped, further restoration would not occur until a focused evaluation is conducted to assess if a potentially significant impact would result from the SBSP Restoration Project or other factors. Management actions would then be implemented to avoid or lessen a significant adverse environmental impact. The AMP also provides a mechanism to adjust, modify, or extend restoration actions implemented in a previous phase to better achieve the project's goals. The findings from ongoing monitoring are used to plan further restoration actions.

The framework of the AMP has been used during the development of the Phase 2 project alternatives, as evidenced by the inclusion in Phase 2 of some ponds that were part of previous restoration actions. The Island Ponds were breached under the Initial Stewardship Plan (ISP), and these ponds are being considered for further modifications in Phase 2. Similarly, Ponds A8 and A8S were part of Phase 1 actions and are being included in Phase 2. The AMP and its findings are being used to guide the inclusion of these ponds in the Phase 2 planning.

Continual implementation of the AMP is an integral component of each alternative considered in the Phase 2 project alternatives. Under all alternatives, monitoring and applied studies will occur, and the AMP will be an integral component in the operations and management decisions at all ponds under all alternatives as well as for restoration decisions in future project phases. More detail on how the AMP is used to make the significance determinations is provided in Section 3.1. The full AMP is provided in Appendix C.

2.1.4 Comprehensive Conservation Plan

The USFWS uses Comprehensive Conservation Plans (CCPs) to guide management of its refuges. The USFWS has prepared a Final CCP for the Refuge. The CCP serves as USFWS's plan for managing the

Refuge. It describes future conditions and long-range guidance to accomplish the purposes for which the Refuge was established. The CCP considered the SBSP Restoration Project, and the CCP is compatible and consistent with the SBSP Restoration Project and all phases of implementation of the SBSP Restoration Project (USFWS 2013). However, the CCP specifically excludes and does not address those lands included in the SBSP Restoration Project and already included in the 2007 EIS/R and other planning and management documents.

2.2 Phase 2 Project-Level Alternatives

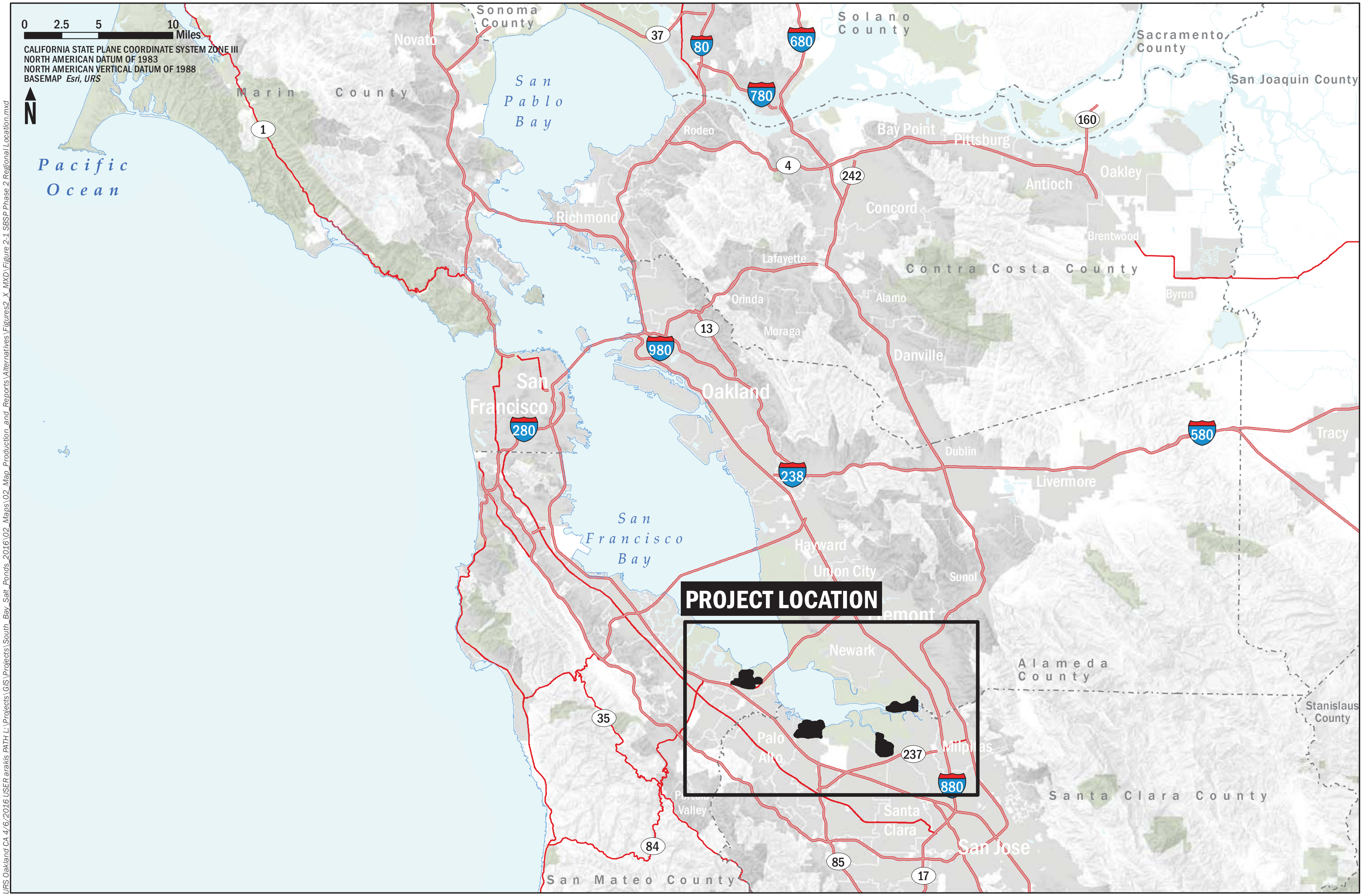
The Phase 2 Action Alternatives propose restoration, flood management, and recreation/public access activities at four separate pond clusters: the Alviso-Island Ponds, the Alviso-Mountain View Ponds, the Alviso-A8 Ponds, and the Ravenswood Ponds. Actions at each pond cluster could be undertaken independently from alternatives at the other clusters. A major consideration in selecting alternatives for Phase 2 was choosing ponds that would not require an extensive land-side flood control element to maintain the existing level of flood protection.

2.2.1 Phase 2 Project Locations

The Phase 2 project would be implemented on the Alviso-Island Ponds, the Alviso-Mountain View Ponds, the Alviso-A8 Ponds, and the Ravenswood Ponds. These pond clusters are at the Don Edwards San Francisco Bay National Wildlife Refuge in Alameda, Santa Clara, and San Mateo Counties, California (see Figure 2-1, SBSP Phase 2 Regional Location, and Figure 2-2, SBSP Phase 2 Project Area Boundary). The Phase 2 projects under consideration also include two areas that are not within the Refuge boundary: the City of Mountain View's Charleston Slough and a small portion of upland in the City of Menlo Park's Bedwell Bayfront Park. Table 2-1 summarizes the Phase 2 pond clusters, the ponds that compose the clusters, and the acreages of each. Alternatives are proposed for each pond cluster, including a No Action Alternative.

Table 2-1 Phase 2 Pond Clusters and Acreages

ALVISO-ISLAND POND CLUSTER		ALVISO-MOUNTAIN VIEW POND CLUSTER		ALVISO-A8 POND CLUSTER		RAVENSWOOD POND CLUSTER	
Pond	**Acres**	**Pond**	**Acres**	**Pond**	**Acres**	**Pond**	**Acres**
A19	265	A1	275	A8	410	R3	270
A20	65	A2W	435	A8S	160	R4	295
A21	150	Charleston Slough	115	—	—	R5	30
—	—			—	—	S5	30
Cluster Total	**480**	**Cluster Total**	**825**	**Cluster Total**	**570**	**Cluster Total**	**625**
						Total Area of Phase 2 Ponds	**2,500**



AECOM
South Bay Salt Pond Restoration Project

Figure 2-1
SBSP Phase 2 Regional Location

URS Oakland CA 4/7/2016 USER harmonk PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-2 SBSP Phase 2 Project Sites.mxd

AECOM
South Bay Salt Pond Restoration Project

Figure 2-2
SBSP Phase 2 Project Sites

These pond clusters and the alternatives for each are described in Sections 2.2.2, 2.2.3, 2.2.4, and 2.2.5, below. In each of those sections, a short introduction outlines the goals and major components of the alternatives there, and a table summarizes the differences between the alternatives. Maps of each of the alternatives are presented to illustrate and clarify the components and the differences between the alternatives. The No Action Alternative is then described, followed by the Action Alternatives that are under consideration for that cluster. In each group of ponds, Alternative A is the No Action Alternative, and each subsequently lettered alternative generally has successively more components and greater amounts of construction. Thus, at a given pond cluster, Alternative C would involve more components that Alternative B, which has more than Alternative A (No Action). One exception to this arrangement is at Ravenswood, where there are three Action Alternatives and where the defining feature of each alternative is not “more components versus fewer components” but rather a different restoration goal for some of the small ponds there.

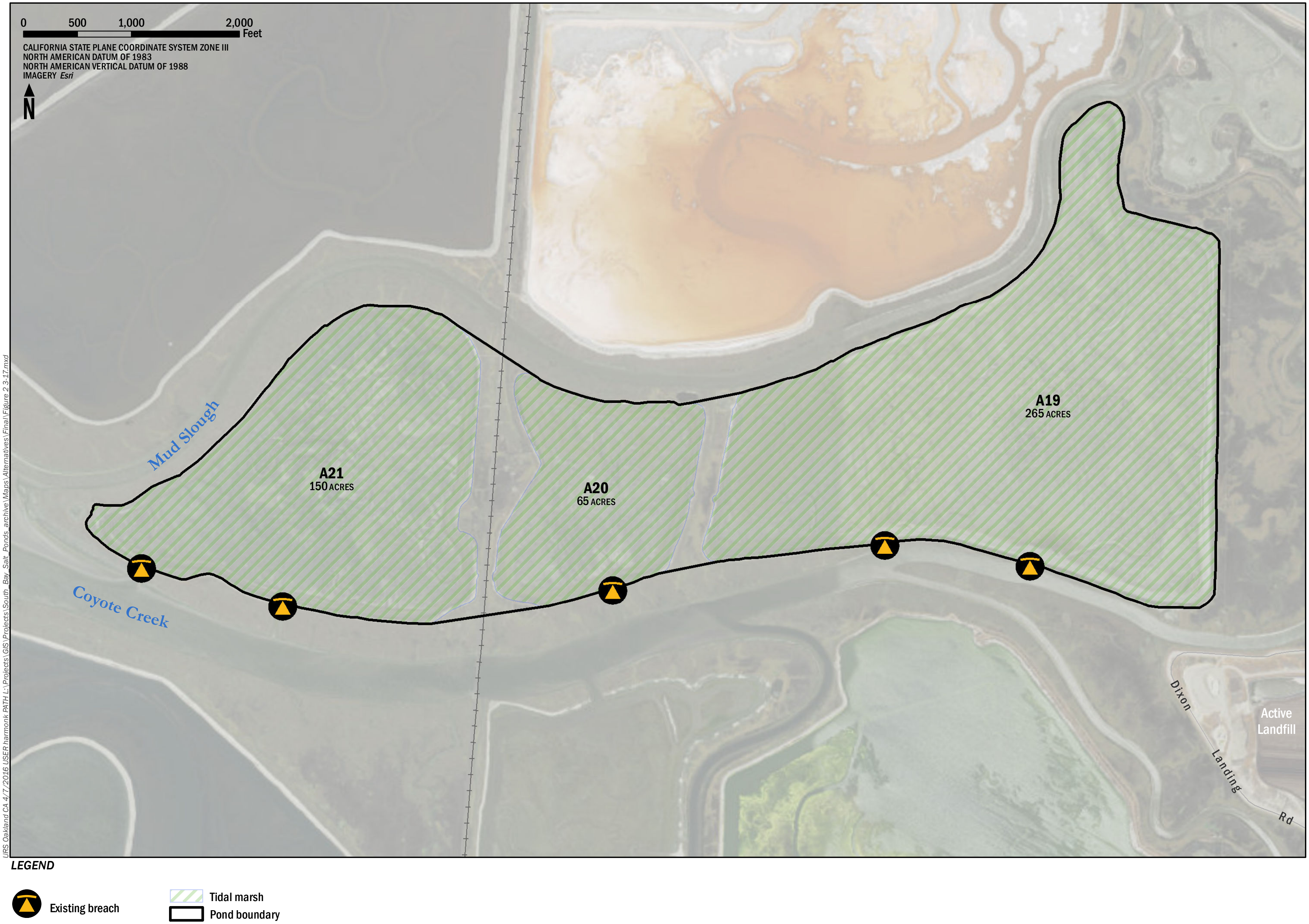
2.2.2 Alviso-Island Pond Cluster

The Alviso-Island pond cluster (also referred to as the Island Ponds) consists of Ponds A19, A20, and A21, the levees surrounding each pond, and some of the fringe marsh outside of these levees, including the narrow marsh between Ponds A19 and A20. Ponds A19, A20, and A21 are in the eastern portion of the Alviso pond complex. These ponds are oriented east to west between Mud Slough to the north and west and Coyote Creek to the south. Mud Slough and Coyote Creek converge at the western edge of this pond cluster. The community of Alviso and the city of Milpitas are to the south and to the east of this cluster, respectively. The ponds are geographically isolated from urbanized and built-out areas by other waterbodies, other salt ponds, and a landfill. The former community of Drawbridge is on a strip of land between Pond A21 and Pond A20. That strip of land also holds an active Union Pacific Railroad (UPRR) track.

Under the No Action Alternative for the Alviso-Island Ponds (Alternative Island A), no new activities would occur in Phase 2. Alternatives Island B and Island C propose activities that increase habitat complexity and improve the distribution of sedimentation and vegetation establishment in these ponds as they transition to tidal marsh. To increase the complexity and connectivity of the Island Ponds and the waterways surrounding them, the activities proposed under these alternatives include breaches of the existing levees at various locations, removal or lowering of levees, and modification of existing breaches. This added aquatic habitat connectivity would benefit salmonids and other estuarine fish. The remaining levee sections would immediately become isolated high ground/island habitat that would eventually become marsh mounds, which have various ecological benefits as high-tide refugia and as focal points for sediment aggregation and vegetation formation. Details about each Phase 2 alternative for this pond cluster are described below.

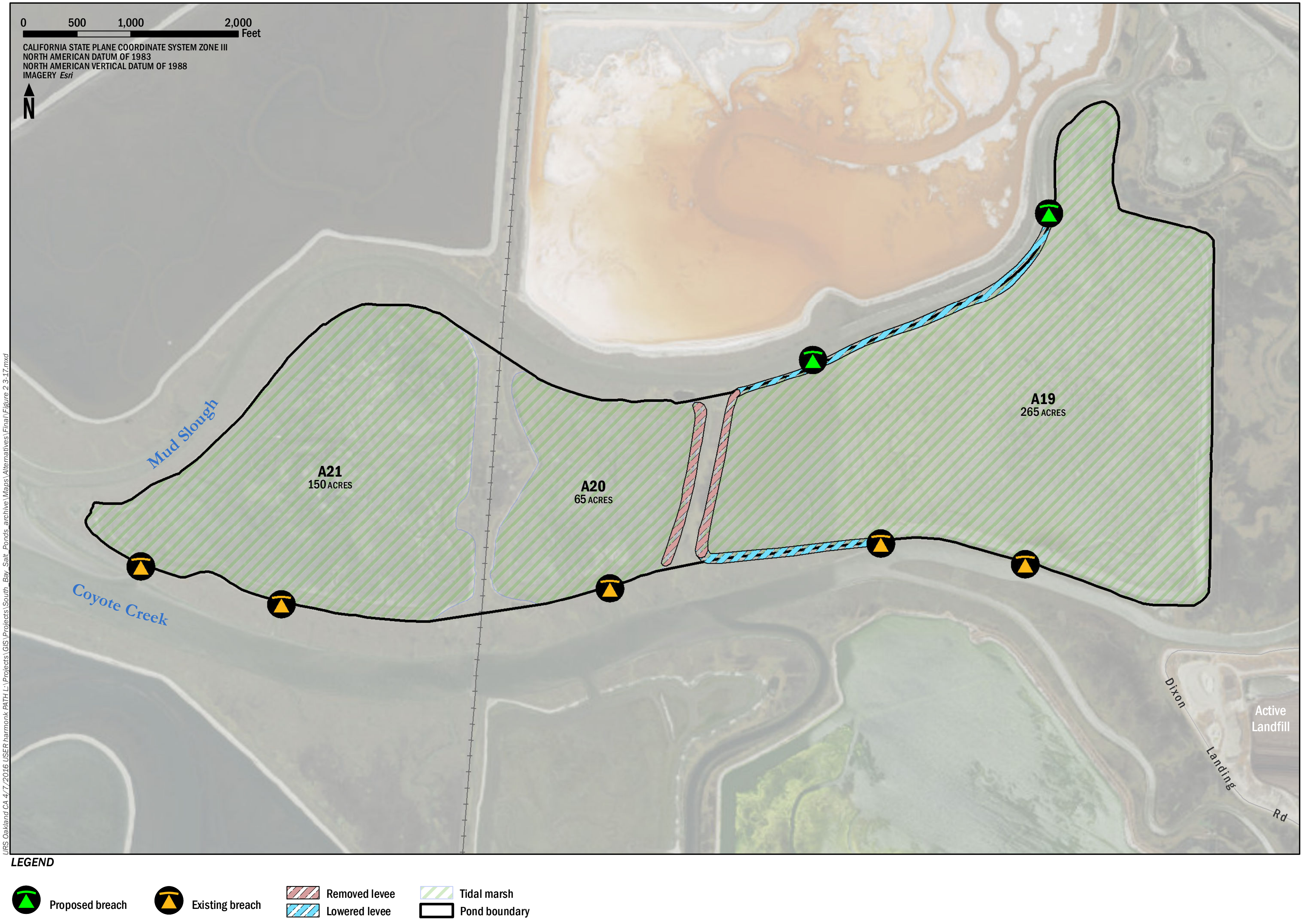
The SBSP Restoration Project does not include recreation or flood control goals for these ponds because they are geographically isolated and difficult for the public to access. Therefore, no flood management or flood control activities or recreation components are proposed at these ponds for Phase 2.

Details about each Phase 2 Action Alternative for this pond cluster are summarized in Table 2-2, illustrated on Figures 2-3 through 2-6, and described in the following sections. The Preliminary Design Memorandum for the Action Alternatives for the Island Ponds is included as Appendix L to this Final EIS/R.



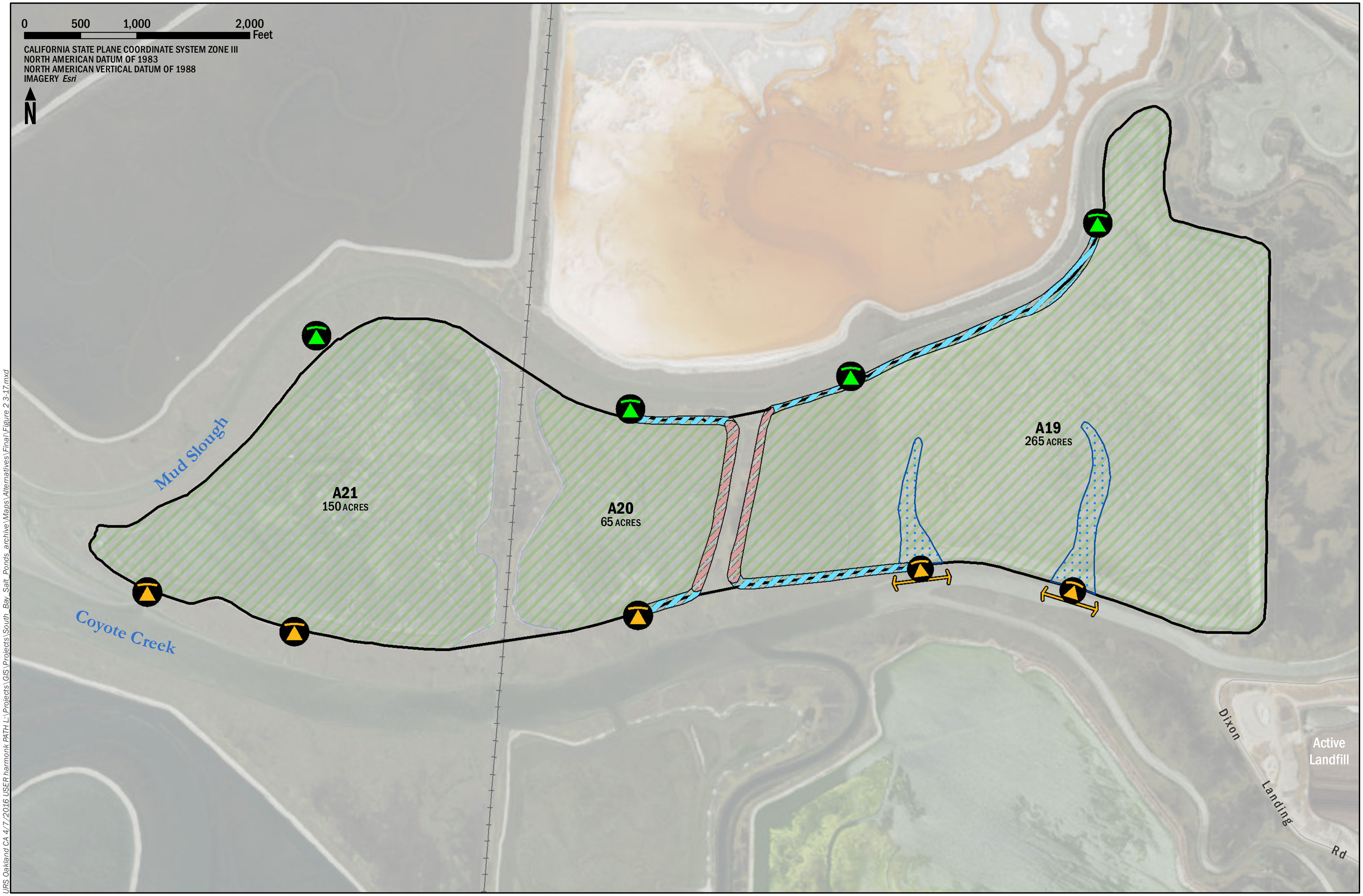
AECOM
South Bay Salt Pond Restoration Project

Figure 2-3
Alternative Island A



AECOM
South Bay Salt Pond Restoration Project

Figure 2-4
Alternative Island B

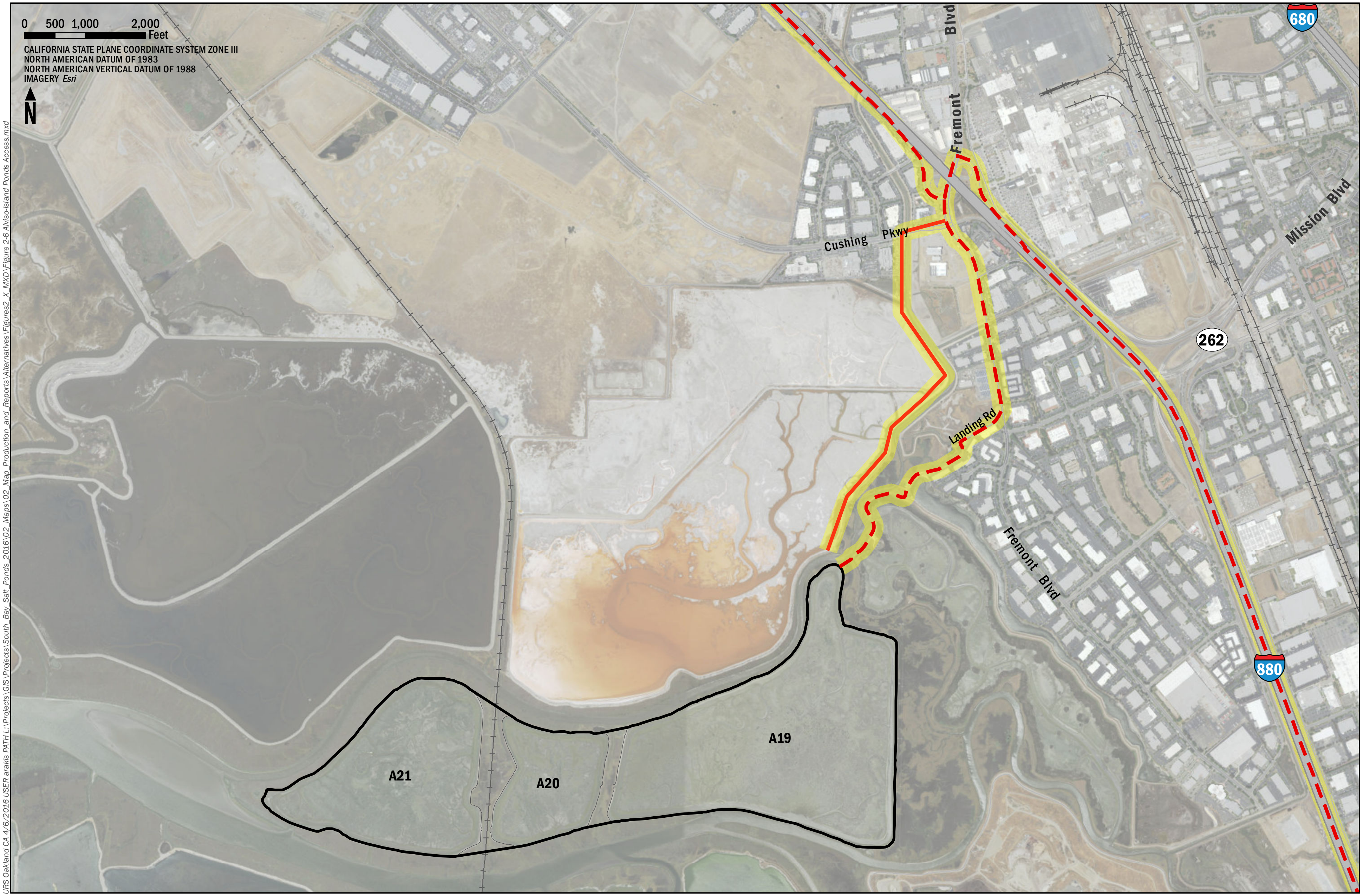


LEGEND

Proposed breach
Existing breach
Expand existing breach
Removed levee
Lowered levee
Pilot channel
Tidal marsh
Pond boundary

AECOM
South Bay Salt Pond Restoration Project

Figure 2-5
Alternative Island C



URS Oakland CA 4/6/2016 USER arakis PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-6 Alviso-Island Ponds Access.mxd

LEGEND

Access Routes

Construction Equipment Access Route

Crew Vehicle Access Route

Phase II Project Areas

AECOM

South Bay Salt Pond Restoration Project

Figure 2-6

Alviso-Island Ponds Access Route

Table 2-2 Components of the Phase 2 Action Alternatives at the Island Ponds

ALTERNATIVE ISLAND B	ALTERNATIVE ISLAND C
Breach north side of Pond A19 in two places.	Breach north side of Pond A19 in two places.
Lower or remove much of Pond A19’s northern and southern levees.	Lower or remove much of Pond A19’s northern and southern levees.
Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.	Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.
—	Breach the north sides of Ponds A20 and A21.
—	Lower portions of Pond A20’s northern and southern levees.
—	Widen existing breaches on Pond A19’s southern side.
—	Excavate two pilot channels within Pond A19.

Alternative Island A (No Action)

Under Alternative Island A, the No Action Alternative, no new activities would occur in Phase 2. The pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The existing breached levees would continue to be scoured from hydraulic action and naturally degrade. Ongoing monitoring to track the progress of these ponds toward tidal marsh would be the principal component of the continued implementation of the AMP at this pond cluster. Additional details regarding the implementation of the AMP are described in Appendix C.

Ponds A19, A20, and A21 were breached on their southern sides in March 2006 as part of the ISP actions. The intent of the 2006 levee breaches was to bring tidal flows to these ponds and allow sediment to accrete until marsh plain elevation was reached. The unmaintained breaches would continue to scour from hydraulic action until equilibrium with the tidal flux is reached, and most levees would be allowed to degrade naturally. The levee containing the active UPRR track would be maintained by UPRR to allow the continued use of the tracks. Under this alternative, this transition to tidal marsh would be allowed to continue. Aside from the monitoring and management activities of the AMP and maintenance of the railroad track, no other operations and maintenance activities would occur. Alternative Island A is shown on Figure 2-3.

Alternative Island B

Alternative Island B would remove or lower the levees between Ponds A19 and A20 and lower westerly portions of the north and south perimeter levees of Pond A19 to increase connectivity and improve the ecological function of both ponds by altering circulation and sedimentation patterns in the ponds and improve the distribution of sediment accretion in Pond A19 and, to a lesser extent, in Pond A20. Alternative Island B also includes some improvements in habitat quality for juvenile salmonids and other fish. Any levee material moved would be used locally to fill borrow ditches (ditches that were created to construct the original levees) or raise the pond bottom elevation and further speed revegetation. The estimated volume of earth cut, fill, and net import for Alternative Island B is listed in Table 2-3.

Table 2-3 Earthwork Volumes of Phase 2 Alternatives

ALTERNATIVE	ESTIMATED EARTHWORK VOLUME (CUBIC YARDS [CY])		
	CUT	FILL	NET IMPORT
Alviso-Island Ponds			
Island A	—	—	—
Island B	109,600	—	—
Island C	202,600	—	—
Alviso-Mountain View Ponds			
Mountain View A	—	—	—
Mountain View B	20,400	316,800	296,400
Mountain View C	51,400	421,000	369,600
Alviso-A8 Ponds			
A8 A	—	—	—
A8 B	—	190,000	190,000
Ravenswood Ponds			
Ravenswood A	—	—	—
Ravenswood B	39,700	77,600	37,900
Ravenswood C	45,400	255,800	210,400
Ravenswood D*	87,900	73,000	—

* Earthwork volumes for Alternative Ravenswood D include SBSP Restoration Project activities, which would generate 56,700 cy of cut material, and the City of Redwood City's Bayfront Canal and Atherton Channel Project, which would generate 31,200 cy of surplus cut material.

Alternative Island B components are illustrated on Figure 2-4. The alternative would include the following activities:

- Breach north side of Pond A19 in two places. The levee on the north side of Pond A19 would be breached in two places to allow tidal flows from Mud Slough to enter the pond. Excavation of the breaches would include excavating a channel through the adjacent fringing tidal marsh. Levee material from the breach would be sidecast into the borrow ditches or pond bottom to speed the return to marsh plain elevation. All new breaches would be roughly 50 feet wide at the bottom with an invert elevation of 0.0 feet North American Vertical Datum of 1988 (NAVD88). The top width would be 120 feet with 3:1 (horizontal to vertical [h:v]) side slopes.

- Lower or remove much of Pond A19's northern and southern levees. Existing levees on the northern, western, and southern sides of Pond A19 would be lowered between the western levee and the existing western breach on the southern levee and between the western levee and the proposed eastern breach location on the northern levee. The western levee of Pond A19 would be removed. Levee lowering would scrape off the tops of levees down to the mean high water (MHW) elevation; levee removal would further lower levees to match the elevation of the surrounding marsh plain. Levee material from lowering and removal would be sidecast into the borrow ditches or pond bottom to speed the return to marsh plain elevation. Perimeter levee lengths of approximately 5,000 feet would be lowered from existing crest elevation to the MHW elevation of 6.9 feet NAVD88. Also, approximately 1,600 linear feet of perimeter levees of Pond A19 would be removed to the elevation of the surrounding marsh plain and have a residual elevation of 6.6 feet NAVD88. (In the areas surrounding the Island Ponds, marsh plain elevation is already close to the MHW elevation in most places.)

- Remove Pond A19's western levee and Pond A20's eastern levee to connect these two ponds. The eastern perimeter levee of Pond A20 (approximately 1,600 linear feet) would be removed to marsh plain elevation of 6.6 feet NAVD88. Along with the levee removal in Pond A19 described above, this removal would increase the connection between Ponds A19 and A20. Levee material from the removal would be sidecast into the borrow ditches or pond bottom to speed the return to marsh plain elevation.

Alternative Island C

Alternative Island C would consist of all of the components of Alternative Island B and four additional components: levee breaches on the north sides of Ponds A20 and A21, lowering of portions of the levees around Pond A20, creation of pilot channels in Pond A19, and widening of the existing breaches on the southern levee of Pond A19. These additional components are intended to further increase the habitat complexity and connectedness as this pond cluster transitions to tidal marsh. Levee material from lowering would be sidecast into the borrow ditches or pond bottoms to speed the return to marsh plain elevation. These actions would alter circulation and sedimentation patterns in the ponds and improve the distribution of sediment accretion in Pond A19 and, to a lesser extent, in Ponds A20 and A21.

Similar to Alternative Island B, improvements would be made for habitat quality for juvenile salmonids and other fish. Under Alternative Island C, the projected increase in sediment accumulation would ensure that the rate of sedimentation accretion and marsh development would keep pace with expected sea-level rise. Any levee material moved would be used locally to fill borrow ditches and further speed revegetation. The estimated volume of earth cut, fill, and net import for Alternative Island C is listed in Table 2-3.

The components of Alternative Island C are described in detail below and illustrated on Figure 2-5:

- Alternative Island B components. Alternative C would implement all Island B activities.

- Breach the north sides of Ponds A20 and A21. Levees on the north sides of Ponds A20 and A21 would be breached. All new breaches would be roughly 50 feet wide at the bottom, with an invert elevation of 0.0 feet NAVD88. The top width is estimated to be 120 feet with 3:1 (h:v) side slopes. Creating the breaches would include excavating channels through the adjacent tidal marsh.

- Lower portions of Pond A20's northern and southern levees. Portions of the northern and southern levees of Pond A20 would be lowered. Perimeter levee lengths of approximately 1,500 linear feet (in addition to all of the levee removal discussed in Alternative Island B) would be lowered from existing crest elevation to the MHW elevation of 6.9 feet NAVD88.

- Widen existing breaches on Pond A19's southern side. The width of the existing southern breaches in Pond A19 would be expanded. The existing eastern breach and western breach along the south perimeter levee of Pond A19 would be widened to have a bottom width of 100 feet and

200 feet, respectively, with an invert elevation of 0.0 feet NAVD88 in both cases. The top widths would be roughly 200 feet and 275 feet, respectively, with 3:1 (h:v) side slopes.

- Excavate pilot channels within Pond A19. Pilot channels would be created in Pond A19 to allow for even delivery of sediment from Coyote Creek into the pond. The pilot channels would be designed to improve sediment distribution; they would extend from the existing breaches on the south levee northward into the pond. Any excavated material would be placed into the borrow ditches to speed the return to marsh plain elevation. Two pilot channels, extending roughly 1,100 feet and 1,500 feet in from the existing eastern and western breaches, respectively, on the south side of Pond A19, would be excavated through the existing pond bed. The invert elevation would be 0.0 feet NAVD88, similar to the invert elevation of the adjacent Coyote Creek. The pilot channels would start at the mouth of the breach with a width similar to that of the breach and gradually decrease to roughly 20 feet at the far end within the pond. The channels would have side slopes of 3:1 (h:v) or greater.

Construction Methods

Construction of Common Elements

Levee Lowering and Removal. All construction activities would involve either partial or complete removal of portions of levee to establish connections with surrounding waterways and/or with each other. Lowering or removal would be accomplished by using excavators. Levee material would be sidecast into the adjacent pond. Movement of the excavator between the perimeter levees of Ponds A19 and A20 would occur at low tide utilizing mats.

The construction access, staging areas, equipment, and construction timing considerations are common to both Action Alternatives at the Island Ponds.

Construction Access. As shown on Figure 2-6, primary access to the Alviso-Island Ponds would be from the adjacent levees at Ponds A22 and A23. Vehicle and heavy equipment access to these ponds is available from levee roads, as shown on Figure 2-6. An amphibious excavator would be offloaded and floated across Mud Slough. Daily access for crews would be from the Fremont Boulevard exit off of Interstate 880, onto Landing Road, and then onto an unnamed levee road that connects to the northeast corner of Pond A19 via small footbridge.

Construction Staging Areas. No staging areas are necessary for work at the Island Ponds. Equipment used for construction would stay within the project footprint, and no material would be brought into the Island Ponds.

Construction Equipment. Construction equipment would include excavators, a barge (for fueling and possibly access to the project site), low-bed truck, other common construction equipment, skiff, and pickup vehicles for transportation in and out of the project site.

Construction Timing Considerations. There are certain special-status species that may be affected by construction activities. The presence of these species may limit construction activities or require certain avoidance and minimization measures. The specific limits and requirements for each species and their habitats will be addressed during the permitting phase of the project. However, the timing considerations below will be incorporated into detailed designs and project planning to reduce the overall potential for adverse impacts and the need for mitigation.

- Bird nesting: Regulatory work windows for bird nesting typically run from February 1 through September 15. Work could likely occur within this window in the presence of a biological monitor and preconstruction surveys.
- Steelhead migration: Activities that may potentially affect adult upstream migration would be avoided from December through February. Similar avoidance of activities that would affect juvenile downstream migration would be avoided from April through June. If applicable, the National Marine Fisheries Service (NMFS) acceptable work windows for steelhead are June through November; a USFWS-approved biological monitor may be required during this period.
- Longfin smelt and green sturgeon: These species could be present year-round. In-channel work may require that a USFWS-approved biological monitor be present.

Construction of Alternative Island B

Order of Construction. In each pond, the construction scenario would likely start removal from the farthest end of the construction access point along the perimeter levees and proceed toward the starting point of the access. For this concept, the likely order of construction in Alternative Island B would be as follows:

1. Lower Pond A19 south perimeter levee.
2. Remove Pond A20 east perimeter levee.
3. Remove Pond A19 west perimeter levee.
4. Lower and breach Pond A19 north perimeter levee starting from west end and progressing to the east end.

Construction Schedule. The construction schedule would be affected by species windows, weather conditions, earthwork quantities, and land disturbance. Construction would be expected to begin in the summer or fall of 2017. A preliminary estimate shows that construction would likely be completed in approximately 16 months over two construction seasons. This estimate assumes that USFWS would permit heavy construction activities to occur during the bird-nesting window with the presence and under the direction of a biological monitor.

Construction of Alternative Island C

The only component of Alternative Island C with a construction method not already described in Alternative Island B is the excavation of the pilot channels. Alternative Island C would also include widening existing breaches and lowering longer sections of levees, but the construction method and equipment to do so would be the same as the method and equipment used to create the new breaches.

Pilot Channel. Excavated material would be sidecast on either side of the channel. Existing soil conditions at the pond bottom are likely to be soft, rendering the bottom unsuitable for driving or support of heavy equipment. Temporary mats with gravel bedding on top would be deployed at the pond bottom to create a firm surface that can handle heavy equipment such as an excavator, loader, and mini-dozer to access the locations where the pilot channels are to be established. Alternatively, amphibious equipment such as an amphibious excavator could be used to excavate in the wet to designed depths.

The construction methods and sequence for Alternative Island C would be similar to those for Alternative Island B. The likely order of construction within the Island Ponds would be follows:

1. Excavate Pond A19 pilot channel.
2. Expand Pond A19 breaches.
3. Lower Pond A19 south perimeter levee.
4. Lower Pond A20 south perimeter levee.
5. Remove Pond A20 east perimeter levee.
6. Breach Pond A21 north perimeter levee.
7. Lower and breach Pond A20 north perimeter levee, starting from west end and progressing to the east end.
8. Remove Pond A19 west perimeter levee.
9. Lower and breach Pond A19 north perimeter levee, starting from west end and progressing to the east end.

Construction Schedule. The construction schedule would be affected by species windows, weather conditions, earthwork quantities, and land disturbance. Construction would be expected to begin in the summer or fall of 2017. A preliminary estimate shows that construction would likely be completed in approximately 19 months over two or three construction seasons. This estimate assumes that USFWS would permit heavy construction activities to occur during the bird-nesting window with the presence and under the direction of a biological monitor.

Operations and Maintenance

Aside from the monitoring and management activities of the AMP and continued maintenance of the existing UPRR track, no other O&M activities would occur at the Island Ponds. The breaches would scour from hydraulic action until equilibrium with the tidal flux is reached, and most levees would be allowed to degrade naturally. The levee containing the existing railroad track would be maintained to allow the continued use of the tracks. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be a component of the continued implementation of the AMP.

2.2.3 Alviso-Mountain View Pond Cluster

The Alviso-Mountain View pond cluster (the Mountain View Ponds) consists of Pond A1, Pond A2W, the levees surrounding each pond, some of the fringe marsh outside of the pond and slough levees, Permanente Creek, and Mountain View Slough. Charleston Slough, which is owned by the City of Mountain View and is not part of the Refuge, is included as part of the Mountain View pond cluster, as are the levees surrounding Charleston Slough.

The Mountain View Ponds are in the western portion of the Alviso pond complex, between the Palo Alto Flood Basin to the west, Mountain View Shoreline Park and Stevens Creek Marsh to the south, Stevens Creek to the east, and open bay water to the north (Figure 2-7). The 115-acre Charleston Slough is at the western end of the cluster. Permanente Creek, which flows into Mountain View Slough, is between Ponds A1 and A2W. The cities of Mountain View and Palo Alto are immediately inland of the pond cluster to the south and west, respectively.

Under the No Action Alternative for the Alviso-Mountain View pond cluster (Alternative Mountain View A), no new activities would occur as part of Phase 2. The Action Alternatives (Alternatives Mountain View B and Mountain View C) propose activities transitioning the ponds to tidal marsh while maintaining or improving existing flood protection along the pond cluster borders with the cities of Mountain View and Palo Alto. Viewing platforms and trails would be established to improve recreation and public access to the pond cluster. The SBSP Restoration Project goals for this pond cluster are to transition to tidal marsh, maintain or improve flood protection, and improve recreation and public access. In addition, the connection of these large ponds to Stevens Creek and to the South Bay itself would provide nursery habitat and enhanced habitat connectivity for salmonids and other estuarine fish.

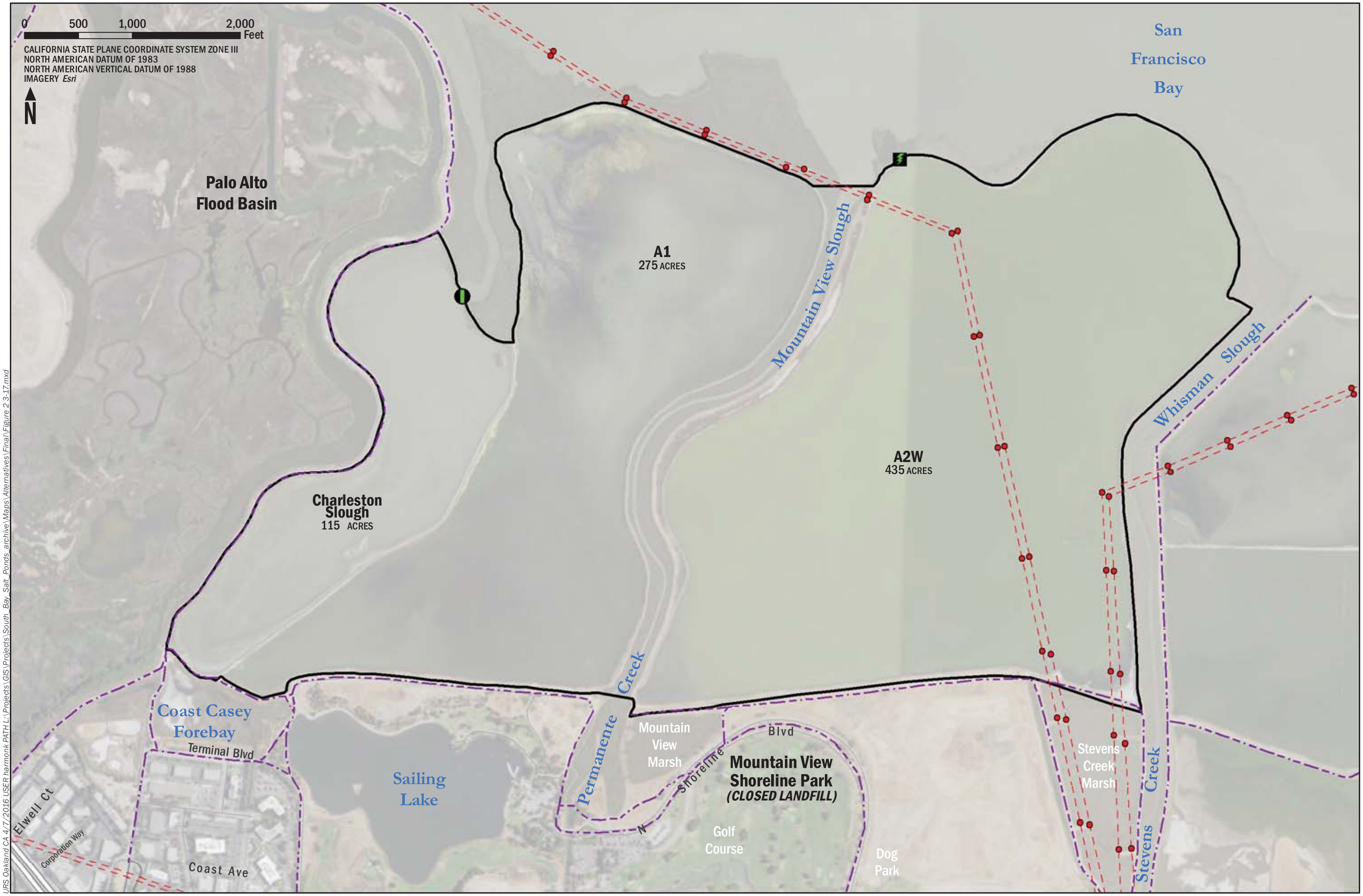
Restoration activities include breaches of levees at various locations, creation of wildlife habitat features, and other levee alterations to improve the overall ecological conditions of Pond A1, Pond A2W, and Charleston Slough.

As an adaptation to future sea level rise, the project is proposing the creation of habitat transition zones at several of the Phase 2 pond clusters. Habitat transition zones are specifically called out in documents such as the U.S. Fish and Wildlife Service’s Tidal Marsh Recovery Plan and the recent Science Update to the Baylands Ecosystem Habitat Goals Project Report. A gradual transition from waters of the Bay or ponds to uplands is largely missing in the current landscape of the South Bay, where there is often a distinct and abrupt boundary between the bay and the built environment. The SBSP Restoration Project’s intention in including transition zones in the Phase 2 alternatives is to restore this missing habitat feature. Doing so would:

1. Establish areas in which terrestrial marsh species can take refuge during high tides and storm events, thereby reducing their vulnerability.
2. Expand habitat for a variety of special status plant species that occupy this specific elevation zone.
3. Provide space for marshes to migrate upslope over time as water levels in the Bay rise.

Before proposing these features, the SBSP Restoration Project examined the landscape to see if there are any areas adjacent to the project site where this could occur naturally. In general, the best locations for building these features would be located adjacent to open space or park land where the project can provide an even greater extent of transition into upland habitats.

However, at the edge of the Bay, these open space areas are largely former (now closed and capped) landfills which present a variety of challenges for creating the missing upland habitat. First, the existing elevation gradient between the restored marsh and the edge of the landfill is usually too steep to provide a gradual transition. Secondly, these landfills would otherwise pose a water quality risk from erosion if tidal action were introduced immediately adjacent to the protective clay liner or un-engineered rip rap slopes.



LEGEND

- Existing control gate
- PG&E turnaround
- PG&E tower
- PG&E power line
- Existing trail
- Pond boundary

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South Bay Salt Pond Restoration Project

Figure 2-7

Alternative Mountain View A

In these instances, it is necessary that the project place material inside the former salt ponds to create the desired slope (15:1 to 30:1). At other locations, the actual elevations landward of the project sites are too low to create an uphill slope with the desired habitat functions. Therefore, once new levees are built to protect that area from tidal flooding, and the only area remaining to build the transition zones is into the salt ponds. Finally, most of the adjacent property is not within the SBSP Restoration Project's ability to acquire, whether or not it has the desired elevation profile, because it is currently developed. In addition to being very expensive to acquire these areas, it would be infeasible to relocate all of the residences and business that have built adjacent to the salt ponds.

For these reasons, the project plans to use fill from upland excavation projects to create habitat transition zones inside the former salt ponds. The transition zones would improve the habitat quality of the restored marsh, particularly for endangered and threatened species, and improve resiliency of the shoreline over time as sea levels rise.

While the greatest additional habitat benefits and resilience to sea-level rise would come from the shallowest slope (the 30:1 ratio being proposed), depending on the volume of material available, the constructed slope could be steeper (i.e., less than 30:1) if less material is available. This would reduce the footprint area of the habitat transition zone and the total volume of fill necessary. This Final EIS/R conservatively assumes and analyzes the greatest environmental impacts, which would come from the largest habitat transition zones (those with the shallowest slope).

Although a reduced slope would also potentially somewhat decrease the additional habitat value and resiliency provided by the transition zones, it would still provide substantial sea-level rise resilience and habitat benefits over the traditional 3:1 slops of the typical levee found at the edge of San Francisco Bay. Because this document will provide clearance under NEPA and CEQA for transition zones of up to 30:1 slopes, any smaller transition zones could be constructed under Phase 2 and enlarged up to that limit at a future time (following the necessary permitting processes) as material becomes available.

Upland fill material would also be used to create habitat islands and improve levees. All imported upland material would be screened in accordance with a new Quality Assurance Plan (QAP) being developed from the model QAP for the Bair Island Restoration Project by Life Sciences, Inc. The QAP will include protocols for off-site imported material testing, classification, and tracking.

It was initially considered possible that dredged material would also be placed in Ponds A1 and A2W to raise the bottom elevations and accelerate marsh formation at these ponds. However, doing so would require a delivery method such as either dredging a barge channel to the ponds or using a sediment slurry pipe and a pumping system. The act of establishing a slurry pipe system with the required offloader and booster stations or dredging a channel for barge delivery of sediments was not feasible to do on either a financial basis or a regulatory one. It would also create numerous additional environmental impacts. Therefore, due to the lack of a feasible delivery plan, a foreseeable dredging partner, and efficient regulatory clearance, this document does not include or analyze the effects of such beneficial reuse of dredged material as part of this project. If this component moves toward being included in the project designs and implementation plan, the appropriate NEPA and CEQA compliance processes (which may include a new EIS/R tiered from this document and the 2007 EIS/R or a supplemental/addendum EIS/R) would be completed before approving the activity.

Alternative Mountain View C would incorporate Charleston Slough into the project and include several actions that are necessary to provide additional flood protection to portions of the cities of Mountain View and Palo Alto and to help maintain the water supply to the sailing lake in Mountain View Shoreline Park.

Details about each Phase 2 Action Alternative for this pond cluster are summarized in Table 2-4, illustrated on Figures 2-7 through 2-10, and described in the following sections. The Preliminary Design Memorandum for the Action Alternatives for the Mountain View Ponds is included as Appendix M to this Final EIS/R.

Alternative Mountain View A (No Action)

Under Alternative Mountain View A, the No Action Alternative, no new activities would be implemented as part of Phase 2. The USFWS would maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System, following the AMP and other management practices. The pond cluster would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices. The levees around Ponds A1 and A2W are classified as high priority levees to be maintained for inland flood protection. These outboard levees would be maintained (or repaired upon failure). The ponds would not be actively managed except for the current water quality management in Pond A2W, which involves circulating water as needed to maintain dissolved oxygen per the existing AMP.

Existing trails on the levees along the boundary of the pond cluster would continue to be maintained. The current use of water in Charleston Slough to supply the water system the Shoreline Park would continue. Alternative Mountain View A is shown in Figure 2-7.

The PG&E towers and power lines that run through Pond A2W and outside of it and Pond A1 would be maintained as described in Appendix D. These activities are already permitted and would continue to take place under Alternative Mountain View A. These maintenance and repair activities include aerial and ground patrol, inspections, equipment inspections, electrical outage repair, and insulator washing and replacement.

Table 2-4 Components of the Phase 2 Action Alternatives at the Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C
Do not include Charleston Slough in tidal marsh restoration.	Include Charleston Slough in tidal marsh restoration.
Raise and improve western levee of Pond A1.	Lower and breach western levee of Pond A1.
Breach the west side of Pond A1 at one location.	Breach Pond A1 at three locations.
—	Breach Charleston Slough and connect it to Pond A1: ▪ Open Charleston Slough to full tidal exchange, by breaching the northern levee or by removing the tide gate structure itself, to allow vegetation to colonize the mud flats surrounding the slough's main channel; ▪ Raise and improve the western levee 1 of Charleston Slough, which separates it from the Palo Alto Flood Basin; ▪ Raise the Coast Casey Forebay levee1 along southern border of Charleston Slough and associated sailing lake water intake and pump station structures; ▪ Add a primary water intake 2 for the Mountain View Shoreline Park sailing lake at the breach in the levee between Charleston

Table 2-4 Components of the Phase 2 Action Alternatives at the Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C
	Slough and Pond A1; ▪ Lower western levee of Pond A1; ▪ Rebuild the existing viewing platform along the Coast Casey Forebay levee; rebuild the existing trail and replace benches and signage along the improved western levee of Charleston Slough; and ▪ Armor levee on landward side of breach between Pond A1 and Charleston Slough.
Construct bird habitat islands in Ponds A1 and A2W.	Add bird habitat islands in Ponds A1 and A2W.
Construct habitat transition zones across entire southern extent of Ponds A1 and A2W.	Construct a habitat transition zone across entire southern extent of Pond A1 but only across a portion of A2W.
Breach Pond A2W at four locations.	Breach Pond A2W at four locations.
Armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for Pacific Gas and Electric Company (PG&E) access.	Armor the two eastern breaches of Pond A2W and add railcar bridges for PG&E access and recreational trail access.
Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from Pond A2W to connect to existing boardwalk over Bay outside of the Palo Alto Flood Basin.	Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from A2W to connect to existing boardwalk over Bay outside of Palo Alto Flood Basin.
Add viewing platform in Shoreline Park south of Pond A1.	Add viewing platform in Shoreline Park south of Pond A1.
Construct spur trail on improved western levee of Pond A1 to a viewing platform.	Construct spur trail on improved west levee of Pond A1 to a viewing platform at the armored breach.
—	Add a spur trail from Bay Trail spine along Charleston Slough's northern levee to a viewing platform at or near the breach location.
—	Add recreational trail on eastern and northern sides of Pond A2W to a bay side viewing platform near PG&E turnaround point.

[1] The proposed improvements to the Coast Casey Forebay levee and the western levee of Charleston Slough would be to an elevation beyond that required by SBSP Restoration Project's requirements; it would be higher to meet City of Mountain View's expectations for sea-level rise.

[2] The proposed water intake at the A1-Charleston Slough breach location requires the intake, pipes, and sump to be constructed under the existing levee out to the breach.

Alternative Mountain View B

Under Alternative Mountain View B, the Pond A1 and Pond A2W levees would be breached at several points to introduce tidal flow in the ponds. Habitat transition zones and habitat islands would be constructed in the ponds to increase habitat complexity and quality for special-status species. A new trail and viewing platform would be installed to improve recreation and public access at these ponds. Upland fill material would be imported into the ponds to raise levees, construct habitat islands, or build habitat transition zones.

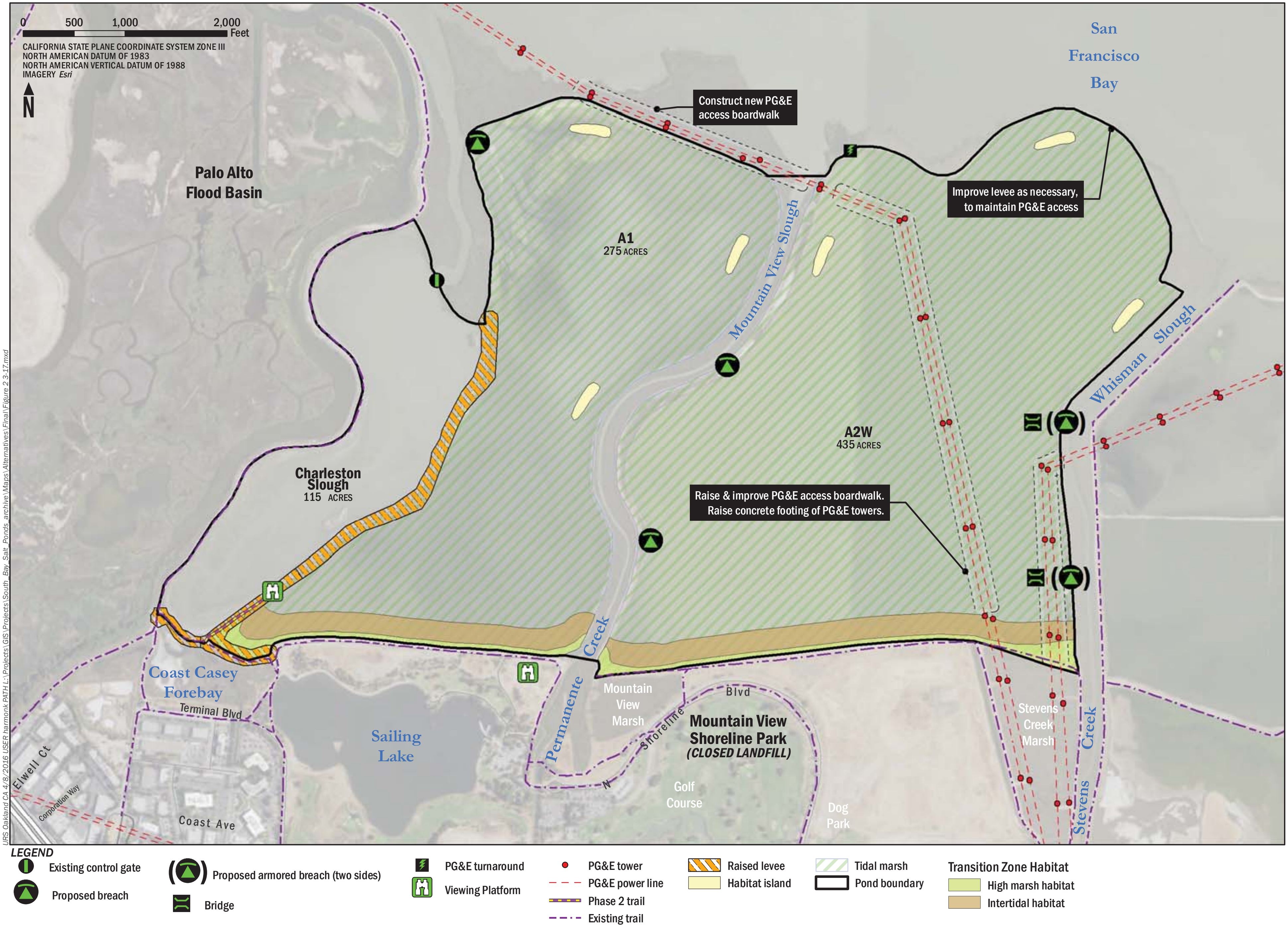
As shown in Table 2-3, Alternative Mountain View B would require approximately 316,800 cubic yards of fill; however, cut activities at the site would generate 20,400 cubic yards of material. Thus, only 296,400 cubic yards would be imported. The rest would be obtained from breached or lowered levees within the project area. Alternative Mountain View B would not include Charleston Slough.

The activities of this alternative are detailed below and illustrated on Figure 2-8.

- Breach the west side of Pond A1 at one location. The west levee of Pond A1 would be breached at a single location to allow tidal flows to enter, sediment to accrete, and vegetation to become established. The breach would be at the northwest corner of the pond on the western levee and would be outside of the Charleston Slough tide gate and levee. Material from the breached levee would be used to build habitat islands or habitat transition zones or improve levees or would be sidecast into Pond A1 to raise the bottom elevation. The northwest breach in Pond A1 would be 250 feet at the bottom width with an invert elevation of 2.0 feet NAVD88 and 3:1 (h:v) side slopes.

- Breach Pond A2W at four locations. Pond A2W would be breached at two locations on the west-side levee and two locations on the east-side levee to bring tidal flows into the pond. The specific locations of these breaches would be determined during advanced construction design, but their locations would generally follow the locations of historical slough traces. Material from the lowered levee would be used to build habitat islands or habitat transition zones or improve levees or would be sidecast into Pond A2W to raise the bottom elevation. The breaches on the west side of Pond A2W would have a bottom width of 100 feet with an invert elevation of 2.0 feet NAVD88 and side slopes of 3:1 (h:v). Pond A2W's east perimeter levee would be breached in two places; at each breach the bottom width would be 28 feet. The invert elevation of these breaches would be 2.0 feet NAVD88 with side slopes of 2:1 (h:v). These breaches would be designed such that the top width would be wide enough to span railcar bridges (described below). Both of the breaches on the eastern side of Pond A2W would be armored on both sides to protect the bridge abutments from future erosion or scour.

- Armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for PG&E access. Railcar bridges would be used to create boardwalks; these bridges would be approximately 60 feet long and 10 feet wide. The bridges would span the two breaches along the Pond A2W east levee to provide a single-lane, all weather access route to the PG&E facilities to the north of Pond A2W. The deck would be 2 feet thick, and the top of the deck would be at an approximate elevation of 10.0 feet NAVD88. Each railcar bridge superstructure would weigh between 70 to 100 tons and would rest on top of cast-in-place concrete abutments. With seismic-resistant shear keys, the abutment stem would be approximately 15 feet long.



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South Bay Salt Pond Restoration Project

Figure 2-8

Alternative Mountain View B

- Raise and improve western levee of Pond A1. A portion of the western levee of Pond A1 would be raised to provide flood protection to inland areas west and south of the Mountain View pond cluster. The levee breach in Pond A1 (described above) would remove the flood protection currently provided by the outboard levees of Pond A1. Raising the western levee of Pond A1 would maintain current levels of flood protection in the communities and infrastructure to the southwest of Pond A1. Much of the material for raising the levee would come from off-site, upland sources, though some would come from on-site breaching. The length of levee that would be raised is approximately 4,350 feet. From the preliminary design, the improved levee would entail a minimum 10-foot-wide crest with side slopes of 5:1 (h:v) or flatter. The crest of the levee would be constructed to an elevation of 10 feet NAVD88. The cross-section would be further refined during the future design phase based on geotechnical investigations and evaluation.

- Construct habitat islands in Ponds A1 and A2W for birds. Nesting and roosting habitat for shorebirds, terns, and dabbling birds would be created through the construction of several habitat islands in Ponds A1 and A2W. The islands would be constructed largely of upland fill material from off-site projects. Depending on the availability of material, up to 16 islands, each with an area of roughly 11,000 square feet, would be constructed in Ponds A1 and A2W. (The actual number of islands constructed is expected to be lower – approximately three to six per pond.) Each island would have a top elevation of 8.0 feet NAVD88 (roughly 3 feet above mean higher high water [MHHW]) and side slopes no steeper than 6:1 (h:v) along the windward side and ranging from 28:1 (h:v) to 12:1 (h:v) along the leeward side. As the ponds transition to marsh, the island habitat will eventually become marsh mounds, which have various ecological benefits as high-tide refugia and as focal points for further sediment aggregation and vegetation formation.

- Construct habitat transition zones across entire southern extent of Ponds A1 and A2W. Habitat transition zones would be constructed in Ponds A1 and A2W along the southern levees of Ponds A1 and A2W to create upland transition habitat between the lower elevation of the pond and the levee. The habitat transition zones would provide habitat for salt marsh harvest mouse (*Reithrodontomys raviventris*) and other terrestrial species (once vegetated) and foraging habitat for a variety of shorebirds. They would also provide a gentle slope for dissipation of wave energy and reduction of erosion potential. The east-west extent of the habitat transition zones would depend on the amount of material available, but under Alternative Mountain View B the habitat transition zones are planned to extend all the way across the southern border of each pond. The habitat transition zones would be constructed primarily of upland fill material from off-site projects. Roughly 3,000 linear feet and 4,600 linear feet of habitat transition zones would be established along the inside slope of Ponds A1 and A2W, respectively. The habitat transition zones would start at elevation 9.0 feet NAVD88. The slope of the habitat transition zones would depend on the material available, but the most gradual slope (i.e., the longest extent of the habitat transition zones into the ponds) would be 30:1 (h:v).

- Add recreation and public access. Two recreation and public access features would be added. In the first, a viewing platform and sign with a bench would be constructed along or near the existing trail on the southern border of Pond A1 near the eastern end of the pond. Wildlife viewing opportunities from the trails along the southern shore of Pond A1 would be improved by brush clearing. This clearing would be conducted within the Mountain View Shoreline Park. In the second, a spur trail would be constructed along the improved western levee of Pond A1 to a viewing platform. The trail would be designed to avoid the landfill cells below and behind the trail.

- Raise concrete foundations of PG&E towers in Pond A2W. Sixteen (16) transmission towers are within Pond A2W. Conversion of this pond to tidal marsh habitat would require PG&E to upgrade the tower foundations to account for the introduced tidal flux and to raise the maintenance/service boardwalks that run under the power lines and provide PG&E access to the towers. The concrete pedestals on which the 16 towers sit would be reinforced with additional concrete placed higher on the tower legs to protect the metal portions of the towers from the corrosive action of saltwater from the highest tides. The total combined area of the new concrete foundation is estimated to be 540 square feet (about 0.013 acre), and the total combined volume of that concrete is 2,160 cubic feet (80 cubic yards).

- Elevate existing PG&E access boardwalks in Pond A2W; construct a new section of boardwalk outside of Pond A1 to connect Pond A2W's outboard levee with the existing boardwalk outside of the Palo Alto Flood Control Basin. All existing boardwalks would be raised a maximum of 4 feet, utilizing the existing boardwalk pillars. The existing boardwalks in Pond A2W are made of wooden planks on a wooden frame that rests on concrete foundations set into the pond bottom. The decking is approximately 6,700 feet long, two to three feet wide, and only intermittently used by PG&E for pedestrian access to the towers. This boardwalk would be removed and replaced with a higher one to retain PG&E access to the towers. The replacement would increase the width of the boardwalk by approximately two feet and thus increase the shaded area of the Bay. The exact amount of added surface area would not exceed 13,500 square feet (0.31 acre). In addition to raising the boardwalk within the pond, a new section of boardwalk would be added to connect the end of the Pond A2W boardwalk with the end of an existing one that lies northwest of Pond A1. The additional boardwalk would be approximately 2,350 feet long and 3 feet wide (7,050 square feet or 0.16 acre). This area the area of new shade added to the bay. The total cross-sectional area of the piles to support this new boardwalk is less than 700 square feet (under 0.15 acre). The total volume of the piles to support the new boardwalk would be approximately 280 cubic yards, of which approximately 186 cubic yards would be below the bay floor (piles must be placed 12 vertical feet below the bay floor), and the remaining 93 cubic yards would be in the water column. The various access points to the boardwalks would be gated to protect against unauthorized human entry and would be designed to exclude terrestrial predators of marsh wildlife species that may use them. This boardwalk would also create a physical barrier that would prevent watercraft from inadvertently entering the ponds and getting stranded on restored marsh or contacting the bellies of the power lines. These boardwalk addition and improvement activities would undergo separate Section 7 consultation under the federal Endangered Species Act.

Alternative Mountain View C

Under Alternative Mountain View C, levees would be breached and lowered to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. The inclusion of Charleston Slough into the SBSP Restoration Project is the primary distinguishing feature between Alternative Mountain View B and Alternative Mountain View C. Other actions would include adding habitat transition zones, habitat islands, and allowing for possible future connectivity with two brackish marshes south (inland) of Pond A2W. Proposed activities under Alternative Mountain View C are intended to increase habitat complexity and quality for special-status species. Flood control would be maintained with improvements to the southern and western levees of Charleston Slough. Several new trails and viewing platforms would be installed or replaced to improve recreation and public access at the pond cluster. Upland fill material would be imported into the ponds to raise levees, construct islands, or build habitat transition zones. To continue providing water to the Mountain View Shoreline Park sailing lake, a new water intake would be constructed at the proposed breach between Pond A1 and Charleston Slough. The current water intake would be retained as a secondary intake source for backup, maintenance, etc.

As shown in Table 2-3, Alternative Mountain View C is estimated to require approximately 421,000 cubic yards of fill; however, only 369,600 cubic yards would need to be imported. The rest would be obtained from breached or lowered levees or other earthwork.

Alternative Mountain View C actions are shown on Figure 2-9a and additional detail is provided on Figure 2.9b.

- Alternative Mountain View B activities. Alternative Mountain View C would include most of Alternative Mountain View B activities. Differences and exceptions are noted and described below.
- Breach Pond A1 at three locations. The western and eastern levees of Pond A1 would be breached at three locations each to allow for tidal flows, sediment accretion, and vegetation establishment in the pond. Specific locations of these breaches would be determined during advanced construction design, but would generally follow the locations of historical slough traces. One of the breaches would be located in the northwest corner of the pond, outside of the current location of the Charleston Slough tide gate. All breaches would be 100 feet at the bottom width with an invert elevation of 2.0 feet NAVD88 and side slopes of 3:1 (h:v). The southern side slope of the southwestern Pond A1 breach would be armored to protect the trail and viewing platform from erosion. Material from the levee breaches would be used to build islands or habitat transition zones or improve levees or would be sidecast into Pond A1 to raise the bottom elevation.
- Breach Charleston Slough and connect it to Pond A1. Charleston Slough would be made fully tidal and connected to Pond A1 by implementing the components listed in the following sub-bullets. Unlike most other project components, these measures are not independent activities; they must be implemented together or not at all.
    - Open Charleston Slough to full tidal exchange to allow vegetation to colonize the mud flats surrounding the slough’s main channel. This component would likely be accomplished by removing the 50-foot-long tide gate near the outer bay side of the slough. The levees on either side of the breach would be cut back to create a breach with a bottom width of 80 feet at an elevation of 1.0 feet NAVD88. The end of the existing levee to the west of the tide gate would require armoring to protect it from scour and to maintain a trail to the viewing platform. Alternatively, the breach could be created by leaving the tide gate in its current position and breaching the existing levee to the east of it. The tide gate would serve as armoring for the on-levee trail and viewing platform above it.

LEGEND

- Proposed breach
- Proposed armored breach (2 sides)
- Proposed armored breach (1 side)
- Bridge
- PG&E turnaround
- Viewing Platform
- PG&E tower
- PG&E power line
- Reconstructed trail
- Phase 2 trail
- Existing trail
- Lowered levee
- Improved levee
- Habitat island
- Tidal marsh
- Pond boundary
- Pond boundary

Transition Zone Habitat

- High marsh habitat
- Intertidal habitat

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Figure 2-9a

Alternative Mountain View C

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South Bay Salt Pond Restoration Project

Figure 2-9b
Alternative Mountain View C - Detaill

- Raise and improve the western levee of Charleston Slough, which separates it from the Palo Alto Flood Basin. From the preliminary design, improved levees would consist of a minimum 36-foot-wide crest with side slopes of 4:1 (h:v) or flatter. The crest of the levee would be constructed to elevation 14 feet NAVD88 (with an option for future elevation to 16 feet NAVD88), with a freeboard of approximately 1.5 feet and to include 30 percent overbuild to allow for settlement over time. These levee improvements were designed to an elevation and with sufficient foundation support for the possible future buildup to meet the City of Mountain View's High Sea Level Rise projections.) The typical cross section includes 8 feet of levee fill underlain by 12 feet of young bay mud. The levee crest will include 4-inch-thick crushed gravel to provide all-weather access on the reconstructed trail.

- Raise the Coast Casey Forebay levee and associated structures. The City of Mountain View seeks to raise approximately 1,000 linear feet of the levee north of the Coast Casey Forebay and structures for the Mountain View Shoreline Park sailing lake pump station, pipelines, and valve vaults. To incorporate the highest sea-level rise prediction from the City of Mountain View's Sea Level Rise Study, Feasibility Report, and Capital Improvement Program (ESA PWA 2012), this levee improvement would build a levee base and foundation support sufficient to support a 16.0-foot NAVD88 cross section but without the top 2 feet (i.e., to a crest elevation of 14 feet NAVD88). This design levee height satisfies the Federal Emergency Management Agency (FEMA) design criteria for 100-year flood level plus 3 feet and gives the City of Mountain View the option of future improvements to address sea-level rise. This design levee height would also improve flood protection along the southern end of Charleston Slough and the communities and infrastructure behind it. In and around this levee are a pump station and a valve vault, and both would need to be raised along with the levee. A pump station control building to the west need not be raised but would be surrounded with a retaining wall. Finally, the existing wooden platform and viewing station that extend into the slough from the trail near the water intake will be elevated to match the raised Coast Casey Forebay levee.

- Add a water intake for the Shoreline Park sailing lake at the breach in the levee between Charleston Slough and Pond A1. As shown on Figure 2-9b, the intake would project into the breach, where it would draw water flowing between the slough and Pond A1. One sediment sump would be placed behind the intake, and a pipe would be placed into a trench on the remaining western levee of Pond A1. The pipe would be covered and would run to a second sediment sump at the base of the levee. To the west, the new pipe would connect to the existing pipe that runs to the sailing lake. This connection would allow for backwashing the new pipe from the lake to keep it clear. The new intake pipe would add approximately 1,000 feet of length to the intake piping. The pipe would be sized to minimize head loss so that backwashing can still occur. The new pipe is expected to be similar to the existing intake pipe: 42-inch internal-diameter high-density polyethylene (HDPE).

- Lower west levee of Pond A1. Approximately 4,730 feet of levee along the western edge of Pond A1 (bordering Charleston Slough) would be lowered from the existing crest elevation to the MHHW elevation of 6.6 feet NAVD88. This lowering would connect Pond A1 to Charleston Slough. The levee would be lowered between the two proposed breach locations to increase tidal flux, provide material to raise the elevation of the pond bottom, and increase habitat connectivity. Material from the lowered levee would be used to build islands or habitat transition zones or improve levees or would be sidecast into Pond A1 to raise the bottom elevation.

  - Rebuild the existing trail and replace benches and signage along the improved western levee of Charleston Slough (described with other recreational elements below).

- Construct a habitat transition zone in Pond A2W. As in Alternative Mountain View B, a habitat transition zone would be constructed in Pond A2W along the southern levee to create transition habitat zones between the lower elevation of the pond and the levee. However, in this alternative, the habitat transition zone would not reach the western or eastern borders of the pond. The eastern extent of this habitat transition zone would terminate along the southern levee to allow for potential future connectivity with the Stevens Creek Marsh immediately behind and to the pond's southeastern corner. Similarly, the western end of this habitat transition zone would terminate along the southern levee to allow for potential future connectivity with the Mountain View Marsh and/or to Stevens Creek Mitigation Marsh immediately behind and to the south of the pond's southwestern and southeastern corners, respectively. The other design details of Pond A1's and Pond A2W's habitat transition zones are unchanged from Alternative B.

- Add recreation and public access. The two recreation and public access features from Alternative Mountain View B would be constructed: the viewing platform along the southern trail on Pond A1 and the trail and viewing platform on the remaining levee on the west side of Pond A1. Also, the existing trail along the western levee of Charleston Slough would be rebuilt on the raised and improved levee described above. In addition, several new recreation and access features would be added: a spur trail and an interpretive feature at the northern end of Charleston Slough, a trail along the levee on the eastern and northern sides of Pond A2W to the end of the PG&E access road. The trail on the eastern and northern levees of Pond A2W would be 8,900 feet (almost 1.7 miles) long. The surfaces and side slopes of those levees would be maintained for PG&E access in Alternative Mountain View B. This alternative would open that route for public recreational access, add signage, and include more-frequent maintenance for safety. The new spur trail would extend 500 feet from the Bay Trail (along the levee between Charleston Slough and the Palo Alto Flood Basin) into the center of Charleston Slough along the remnant of the outer levee of Charleston Slough to the location of the breach (described above).

Construction Methods

Construction of Common Elements

Levee Lowering. Lowering would be accomplished by using an excavator and loader and hauling removed material to locations receiving fill for habitat transition zone or island construction.

Levee Breaching. Breaching would be accomplished from the levee crest using excavators and hauling material to locations receiving fill for levee improvement or habitat transition zone construction.

Habitat Islands. The material for the habitat islands would be placed using four portable barges that would be assembled in the pond. One barge would have a mounted excavator and the others would be used to transport fill material. The crane used to offload and assemble the barges would also be used to load them with fill. Once loaded, a skiff would transport the material barge to the island site where it would be tied up to the work barge. The excavator would place the material in the pond. While one barge is being offloaded, others will be loaded and transported to the work site to keep the operation continuous.

A water truck would be used for dust control. The material would be piled in layers and compacted by a vibratory hand tamper or a roller. The top surface of the proposed habitat islands would be treated with a combination of rock, shell, and sand; current designs include a 12-inch-thick sand layer underlain by 6-inch-thick crushed rock to cover any surficial cracks and prevent weed establishment. The sand layer would be covered with a 4-inch-thick layer of oyster shells, if available, to provide a barren land sight that is typically preferred by some nesting birds.

Habitat Transition Zones. Habitat transition zones would be constructed by placing fill material at roughly 30:1 (h:v) side slopes and compacting to 70 to 80 percent dry density to enable vegetation establishment. Slope protection would be maintained by establishment of native vegetation. Hydroseeding or other seeding method with a native plant mix, development of a planting scheme, and invasive plant control would aid in establishing desirable vegetative habitat.

Railcar Bridges. The railcar bridge superstructure would rest on top of cast-in-place concrete abutments. The integrated concrete wing walls would be built with stem to contain the embankment. Because the bridge is not subject to busy traffic, a concrete approach slab is not required. The abutments would be supported with multiple 14-inch x14-inch precast pre-stressed concrete piles with an estimated total of eight piles at each abutment. The pile length is assumed to be 45 feet long.

A safety railing would be installed on both sides of the deck. These railings would be a heavy-duty barrier for truck crushing load or would be simplified steel-tube railing for walking personal protection.

Dewatering. Armoring and bridging of breaches on the east levee of Pond A2W would be done in dry conditions. Installation of cofferdams would be required at the breach and bridge locations to facilitate the construction of concrete abutments and wingwalls. Pumped water would be discharged downstream of the construction area and possibly directed to a slough.

Levee Improvements. Levee improvement would require clearing of vegetation, debris, and grooving. Fill would be placed in 8-inch-thick lifts and compacted either through a vibratory hand tamper or a roller to achieve 90 percent compaction. Borrow material would be sourced from off-site stockpiles. On-site sources would include excavated material from levee lowering and breaching activities. Levee crests destined for trail access would be finished with a 4-inch-thick layer of crushed gravel to provide all weather access and to be compliant with the Architectural Barriers Act (ABA) on federal lands and the Americans with Disabilities Act (ADA) where the trails are part of the Bay Trail system or where project partners (e.g., city, county, or state agency) have compliance obligations.

Trails, Platforms, Signs, and Benches. All rebuilt trails on existing levees that would be raised or modified as part of this project would be resurfaced to match the existing conditions.

A new trail would be built on the improved Pond A1 west levee. Eroded or uneven surfaces on existing levees would be regraded for ADA and ABA compliance. Surfacing materials would be decomposed granite with timber or concrete edging. These materials would be placed with dump trucks and bulldozers.

The new viewing platforms would be constructed of wood and placed on cast-in-place concrete abutments. The footings would be dug with an auger attachment on a bobcat. Concrete would be imported by concrete truck and the footings would be cast-in-place. Platform materials would be delivered by flatbed truck and assembled on-site. The signage at the platforms would be mounted on pedestals, and a bench would be located near each interpretive sign.

Boardwalk Improvement and Addition. The new boardwalks would be placed within the existing PG&E right-of-way (ROW), adjacent to the towers. All new sections of boardwalk would be built 3 to 5 feet above the height of the existing boardwalk. The boardwalk spans would be 3-foot-wide sections and would include a double handrail. The boardwalk spans would be built in 20-foot-long sections supported by 4-inch by 4-inch vertical plastic lumber posts, known as support footings, which would be spaced 10 feet apart along the boardwalk spans. The boardwalks would parallel the transmission line towers and would include additional lateral boardwalks, which would be used to access each tower from the main boardwalk.

PG&E crews would manually push the support footings into the bay floor to an approximate depth of 12 feet. A small amount of mud would be displaced by the support footings. PG&E is proposing to use only plastic lumber or untreated wood for boardwalk work. Plastic lumber would last longer than wood, and the use of untreated wood would ensure that the least amount of potential long-term environmental impacts will result. In general, an eight-person crew would at each site. All work would be conducted by hand, and equipment used to install the boardwalks—including generators and chainsaws—will be mobilized to the boardwalk locations on foot.

Working from the land-side end of the existing boardwalk at the southern end of Pond A2W, the decking/planks of the existing boardwalk would be removed, and the old piles pulled. Rebuilding each removed segment of the boardwalk would proceed before the next segment is removed, so that crews would be working from newly built segments. Some of this work may be done by a crew working from the existing boardwalk, but much of the demolition and removal would be done from a small boat and the use of an 8-foot by 10-foot floating device. Some of the old piles and decking would be placed on the floating device and hauled out, and some would be transported on special hand-built and hand-powered dollies. In the areas closest to shore, where water may be too shallow for a barge, some work may also be done while standing on temporary trellises or other work platforms, which would be placed on the pond bottoms. This would involve some foot traffic on the pond bottom and along the edge of the pond.

Wooden safety railings would be added in a similar manner. As is the current condition, gates and fences with razor wire would be placed on each end of the boardwalk to prevent public access and entry to the boardwalks; it would also deter mammalian predators. All boardwalks would be constructed according to PG&E specifications.

As shown on Figures 2-8 and 2-9, the two replacement boardwalks inside of Pond A2W would extend approximately 6,700 feet combined from the border with Mountain View Shoreline Park, through the pond to the outer bay-facing levee or to the levee bordering Stevens Creek. On the other side of the outer, bay-facing levee levee, the new length of boardwalk (approximately 2,350 feet long) would extend west-northwest from the Pond A2W levee to connect with the existing PG&E boardwalk to the north of Pond A1.

This boardwalk would be built in a similar, stepwise manner as the one inside of Pond A2W, with each new segment of boardwalk being built from the segment most recently constructed. This outer section of boardwalk would be in deeper water that is not expected to eventually become tidal marsh but rather to remain open bay.

The duration of the boardwalk-related construction activities would be 20 weeks, assuming PG&E crews would work 10-hour days, 7 days per week. These tasks would require 8 workers. Construction monitoring will be conducted as directed by PG&E's Environmental Compliance Management Plan (ECMP).

Adding Concrete for Tower Foundation Improvements. Boardwalk work would be completed first for worker safety and to more efficiently transport materials and tools to the towers. Following the completion of boardwalk replacement and construction, work would be performed on the footings of the towers in Pond A2W. Multiple towers will be worked at the same time from each side of the boardwalks. All structures will require adding additional concrete to existing concrete foundations to a greater height of up to 4 feet above existing structure footing.

Equipment required for this project involve: wheel barrels, hand tools, drills, saws, jackhammers with air compressor, barge and pickup trucks. The material would be moved to each specific work site by hand or wheelbarrow. The new concrete would either be mixed at each tower location or hauled in with a wheelbarrow to each location to the levee and removed in wheelbarrows for disposal.

To upgrade the concrete foundations of the four legs of each tower, the following general steps would be taken: PG&E would construct a cofferdam around each of the footings, dewater the space between the cofferdam and the existing foundations, build a form for pouring additional concrete, pour the concrete, and remove the cofferdam.

The cofferdams would be installed at low tide to allow access to the foundation footing. The cofferdams would be constructed of 1-inch plywood and 4-inch by 4-inch wooden strongbacks. These would be placed around each footing. Mud would be removed by hand, and the dam pushed down to expose the solid piling, usually 3 feet below the mud line. The mud would be returned to the base of the footing after the cement is poured.

The dewatering would be done by pumping the enclosed pond water out of the cofferdam and back into the pond. Pumps would be gas- and diesel-powered. Each cofferdam could be dewatered in fewer than 6 hours of pumping. The pumps would be delivered to the towers via the boardwalks or by barge.

During the time that the tower foundations are exposed, new/replacement concrete footings would be poured between the reinforcements. Each footing would be chipped down to roughen concrete to accept the new concrete cap. Stockpiles would be necessary at each end of the boardwalks. Crews will use the existing boardwalk to transfer removed concrete to staging site located on the maintained outboard levee, loaded onto trucks, and transported to PG&E's facility in Newark for disposal. Any necessary steel repairs would be performed before the new concrete cap is added to the existing footing.

New pins would be inserted to form a new rebar cage around the pile to act as the form, and the concrete would then be poured. All concrete will be mixed by hand at each tower site. The new concrete caps would be at elevations three to five feet higher than the existing footing height. The cofferdam would be removed once the concrete is dry.

Footing repairs can be done within a work area extending approximately 2 feet from the footing. In very shallow water or at low tides, rubber mats could be used for short periods to gain temporary access to perform maintenance work and would be placed to help protect the vegetation around the boardwalk being built.

The duration of the tower foundation improvements would be 20 weeks, assuming PG&E crews would work 10-hour days, 7 days per week. These tasks would require 8 workers. Construction monitoring will be conducted as directed by PG&E's Environmental Compliance Management Plan. (ECMP).If necessary for schedule compression, work on tower foundations near segments of boardwalk that have already been replaced or constructed could be implemented prior to the completion of all boardwalk work. However, this analysis assumes that these activities do not overlap.

Construction Access. As shown on Figure 2-10, primary access to the project site from U.S. 101 would be via North San Antonio Road, past Terminal Boulevard to the edge of Charleston Slough and Pond A1. The exact route(s) used for material delivery are subject to modification due to City of Mountain View requirements for traffic control, Shoreline Park activities, and (as described in Section 3.5) burrowing owl protection. The SBSP Restoration Project will develop the final haul routes in consultation with the City of Mountain View's traffic engineers to minimize potential traffic impacts. The preliminary routes shown on Figure 2-10 are intended for planning and impact analysis purposes.

Construction crews would typically consist of five to ten people. The pond cluster would likely be accessed by construction crews from U.S. 101, after which various arterial, collectors, and local streets provide access to Mountain View Shoreline Park and the ponds beyond it. Heavy vehicles would avoid crossing structures in the levees if the vehicle exceeds the weight-bearing capacity. If this is not possible, engineer-approved precautions would be taken to avoid damaging the structure.

Construction Staging Areas. Construction staging areas will be established within Mountain View Shoreline Park at locations to be determined in coordination with City of Mountain View. The staging areas will be adjacent to the southern borders of Ponds A1 and A2W in upland areas alongside existing roads and trails.

Construction Equipment. Construction would be accomplished using excavators, bulldozers, dump trucks, a compaction roller, a water tanker, refueling tanks, pile-driving equipment, pumps, sheet piles, cranes, a portable barge, skiffs, paving equipment, and pickup vehicles for transportation in and out of the project site. Helicopters may be needed in areas where new boardwalks are constructed. Temporary fill would also be used at staging locations if required. Fill material would be transported to the project area by trucks.

Construction Timing Considerations. There are certain special-status species that may be affected by construction activities. The presence of these species may limit construction activities or require certain avoidance and minimization measures. The specific limits and requirements for each species and their habitats will be addressed during the permitting phase of the project. However, the timing considerations below will be incorporated into detailed designs and project planning to reduce the overall potential for adverse impacts and the need for mitigation.

- Bird nesting: Regulatory work windows for bird nesting typically run from February 1 through September 15. Work could likely occur within this window in the presence of a biological monitor and preconstruction surveys.

- Steelhead migration: Activities that may potentially affect adult upstream migration would be avoided from December through February. Similar avoidance of activities that would affect juvenile downstream migration would be avoided from April through June. If applicable, the National Marine Fisheries Service (NMFS) acceptable work windows for steelhead are June through November; a USFWS-approved biological monitor may be required during this period.

- Longfin smelt and green sturgeon: These species could be present year-round. In-channel work may require that a USFWS-approved biological monitor be present.

URS Oakland CA 4/7/2016 USER harmonk PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-10 Alviso-Mountain View Access.mxd

LEGEND

Phase II Project Area
Material staging area
Access Route
Needs PG&E easement
Trail crossing
Trail detour

AECOM
South Bay Salt Pond Restoration Project

Figure 2-10
Alviso-Mountain View Ponds Access Route

Construction of Alternative Mountain View B

Construction Sequence. Construction could occur simultaneously at both ponds, but the activities could also proceed independently. Earthwork activities would be sequenced such that activities that would be efficient and feasible to perform in the dry season, such as working on levee tops, would be completed first. Levee lowering and breaching along the outer bounds of the ponds that are designed to establish hydraulic connection with adjacent sloughs would be performed after all the internal pond activities are completed. Construction of nesting islands would be performed prior to breaching the perimeter levees.

From this concept, the likely order of construction for this alternative would be as follows:

1. Raise and improve Pond A1 western levee.
2. Construct trail on Pond A1 western levee to viewing platform.
3. Construct PG&E tower and boardwalk improvements around Pond A2W (must be completed prior to levee breaching).
4. Construct habitat transition zones and nesting islands (must be completed prior to levee breaching).
5. Install cofferdams and construct bridges.
6. Breach perimeter levees at Ponds A1 and A2W.
7. Install viewing platform in Mountain View Shoreline Park and viewing platform on Pond A1 levee.

Construction Schedule. The construction schedule would be affected by species windows, weather conditions, earthwork quantities, and land disturbance. Construction is expected to begin in the summer or fall of 2017.

Construction of abutment structure and installation of railcar bridges would require up to 21 days. Installation of viewing platforms is estimated to take no more than a week each.

At contractor's preference, some of the construction activities could occur in tandem with multiple crews to achieve project goals. Construction would likely be completed in approximately 27 months over three construction seasons. This estimate is based on the assumption that some heavy construction activities would be permitted to occur during the nesting habitat window under the watch of a biological monitor.

Construction of Alternative Mountain View C

The methods of construction of Alternative Mountain View C, including construction access and staging areas, would be similar to those used for Alternative Mountain View B. However, some additional or different construction methods would be implemented for the following components:

- The western levee of Charleston Slough would be raised to 14 feet.
- The portion of trail (part of the Bay Trail spine) that is currently on top of the western levee of Charleston Slough would be reconstructed after the levee is raised.

- A spur trail from the Bay Trail along Charleston Slough would be built along the remaining levee that extends out into the slough to the breach location.
- The PG&E access road on the eastern levee of Pond A2W would be further modified to include a recreational hiking/bicycling trail out to the bay.
- Caution would be exercised when sourcing from levee-lowering activities at Pond A1 to stay at elevations above the MHHW until construction activities within the pond that need to be performed in the dry season (i.e., armoring the breaches that would have bridges over them) are complete. Levee crests destined for trail access would be finished with a 4-inch-thick crushed gravel layer to provide all weather access and to be compliant with the ABA on federal lands and the ADA where the trails are part of the Bay Trail system.

Construction Sequence. The text below summarizes the construction activities for Alternative Mountain View C. Construction would be similar to Alternative Mountain View B. The likely order of construction for Alternative Mountain View C would be as follows:

1. Improve west-side levee along Charleston Slough.
2. Construct PG&E tower and boardwalk improvements around Pond A2W (must be completed prior to levee breaching).
3. Rebuild trail on top of raised western levee of Charleston Slough.
4. Improve and armor Pond A1 southwestern levee and Coast Casey Forebay levee along southern border of Charleston Slough.
5. Construct new water intake system at breach location along Pond A1 west levee and make other improvements to pump station.
6. Rebuild existing viewing platform over Charleston Slough from raised and improved Coast Casey Forebay levee.
7. Construct habitat transition zones and nesting islands.
8. Install cofferdams and construct bridges on east levee of Pond A2W.
9. Construct trail on eastern levee of Pond A2W.
10. Construct spur trail on Charleston Slough’s outer levee.
11. Breach perimeter levees at Ponds A1 and A2W; lower Pond A1 west-side levee near Charleston Slough.
12. Remove Charleston Slough tide gate; armor west side of that opening.
13. Construct trail along improved and armored western levee of Pond A1 to a viewing platform at the breach location.
14. Install viewing platforms.

Construction Schedule. The construction schedule would be affected by species windows, weather conditions, earthwork quantities, and land disturbance. Construction is expected to begin in the summer or fall of 2017.

Construction of abutment structure and installation of railcar bridges would require up to 21 days. Installation of water intake structures is estimated to take approximately 3 months. Installation of the viewing platforms is estimated to take no more than a week each.

At the contractor's preference, some of the construction activities could occur in tandem with multiple crews to achieve project goals. Construction would likely be completed in approximately 35 months over five construction seasons. This estimate is based on the assumption that some heavy construction activities would be permitted to occur during the nesting habitat window under the watch of a biological monitor.

Operations and Maintenance

Operations and maintenance of this pond cluster would be similar under Alternatives Mountain View B and Mountain View C. However, some of those maintenance activities would occur in different places (e.g., on the western levee of Charleston Slough instead of on the western levee of Pond A1) or over a larger or smaller area (e.g., Alternative Mountain View C has more trails to maintain and fewer square feet of habitat transition zones). Otherwise, the operations and maintenance activities described below apply to both Action Alternatives.

Operations and maintenance activities would continue to follow and be determined by the 2009 USACE permit #2008-00103S, applicable county operations, and the AMP. PG&E would continue to operate and maintain its infrastructure, which would occur in coordination with the Refuge managers to ensure consistency with the operations and maintenance of the pond cluster. The City of Mountain View would continue to operate and maintain its properties that are adjacent to the pond cluster, and these activities would also occur in coordination with the Refuge managers.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance activities would require a maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, invasive plant control, and vandalism repairs. AMP monitoring activities would also occur, which would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there may be more trips to the site than during the non-breeding season).

In Alternative Mountain View B, the western levee of Pond A1 would require ongoing levee maintenance because it would provide flood protection. In Alternative Mountain View C, this maintenance would instead take place on the western and southern levees of Charleston Slough. These levee maintenance activities would include placement of additional earth on top of, or on the sides of, the levees as the levees subside, with the level of settlement dependent on geotechnical considerations. In general, pond levees that are improved to provide flood protection would likely exhibit the greatest degree of settlement. Levees that require erosion control measures would also require routine inspections and maintenance. If the levees that provide flood protection are improved to provide FEMA 100-year flood protection, a detailed levee maintenance plan would be required for certification to comply with FEMA standards.

The northern perimeter levee, eastern levee, northern portion of the western perimeter levee at Pond A1, and the western levee of Pond A2W would not be maintained and would be allowed to degrade naturally. The eastern and northern levees of Pond A2W would be maintained for PG&E access.

Improved levees would be inspected and maintained for slope stability, erosion control, seepage, slides, and settlement on an annual basis. Maintenance is expected to occur every 5 years to add additional fill material in areas where settlement occurs. Most of the maintenance would be accomplished during low tides and from the levee crest.

Maintenance of the nesting islands may require weed/vegetation removal as often as quarterly and the placing of fill material (sand, gravel, and/or oyster shells) before the onset of the nesting period in some years. Nesting islands would also be periodically examined for erosion.

Maintenance of habitat transition zones would include inspections and maintenance for slope stability, erosion control, seepage, slides, and settlement on an annual basis. As necessary, vegetation removal would occur to prevent colonization by invasive species. Fill material would be placed, when needed, to respond to areas where erosion is observed. Additional maintenance activities may also be a need to address an AMP-specified management trigger.

Public access and recreation features would be maintained as needed to keep trail surfaces safe and accessible. There would be a need for trash removal along trails and more intensely at staging areas and trailheads. The viewing platforms would be designed to minimize maintenance by utilizing durable and sustainable materials as much as possible to prevent degradation and the need for repeated maintenance. These would need to be checked periodically for defacement of interpretive boards and other forms of vandalism.

Railcar bridges placed in publicly accessible areas such as city streets and highways must be visually inspected every 2 years and a report on their condition may be required every 5 years. In Alternative Mountain View B, the bridges would not be publicly accessible, so this inspection and this report would not be required. However, because Alternative Mountain View C would include a public access trail along the eastern levee of Pond A2W, the railcar bridges over the breaches there would need to be visually inspected and reported on as described above.

The proposed bridges and the concrete abutments with wingwalls at both ends of the bridge would be basically maintenance free for the design life cycle of 50 to 75 years. The bridges' superstructures include main span girders, a lateral bracing system, deck slab systems, and a safety railing that would need basic erosion protection maintenance work every few years. These activities may include sanding, cleaning, and re-painting as needed, which are common activities for all steel structures permanently exposed to weather.

The PG&E towers, boardwalks, and power lines would be maintained in accordance with PG&E's current practices, which are described in Appendix D. The maintenance of Pond A2W's eastern and northern levees and the construction of new and improved boardwalks for PG&E's use would continue to provide the necessary access at the current levels.

2.2.4 Alviso-A8 Pond Cluster

The Alviso-A8 pond cluster (the A8 Ponds) consists of Ponds A8 and A8S and the levees surrounding each pond. This pond cluster is in the south-central portion of the Alviso pond complex, between the

Guadalupe Slough and Alviso Ponds A5 and A7 to the west; Sunnyvale Baylands County Park, Guadalupe Slough, and San Tomas Aquino Creek to the south; Alviso Slough to the east and northeast; and San Francisco Bay to the north. The cities of Sunnyvale and Santa Clara are inland of the pond cluster to the south; a capped landfill lies to the southeast.

The SBSP Restoration Project set the initial goals for this pond cluster to be reversibly tidal habitat to address mercury concerns and later to possibly become fully tidal habitat, maintain or improve flood protection, and improve recreation and public access. Ponds A8 and A8S were physically connected in the Phase 1 actions and were made “reversibly muted tidal habitat” by removing parts of the levees (and associated vehicle access) between them and between Pond A8 and the adjacent Ponds A5/A7 to the west. A reversible, armored notch (smaller than a full breach that can be closed seasonally) was made in the eastern levee of Pond A8 to allow some muted tidal exchange and to allow the USFWS to vary the size of the notched opening.

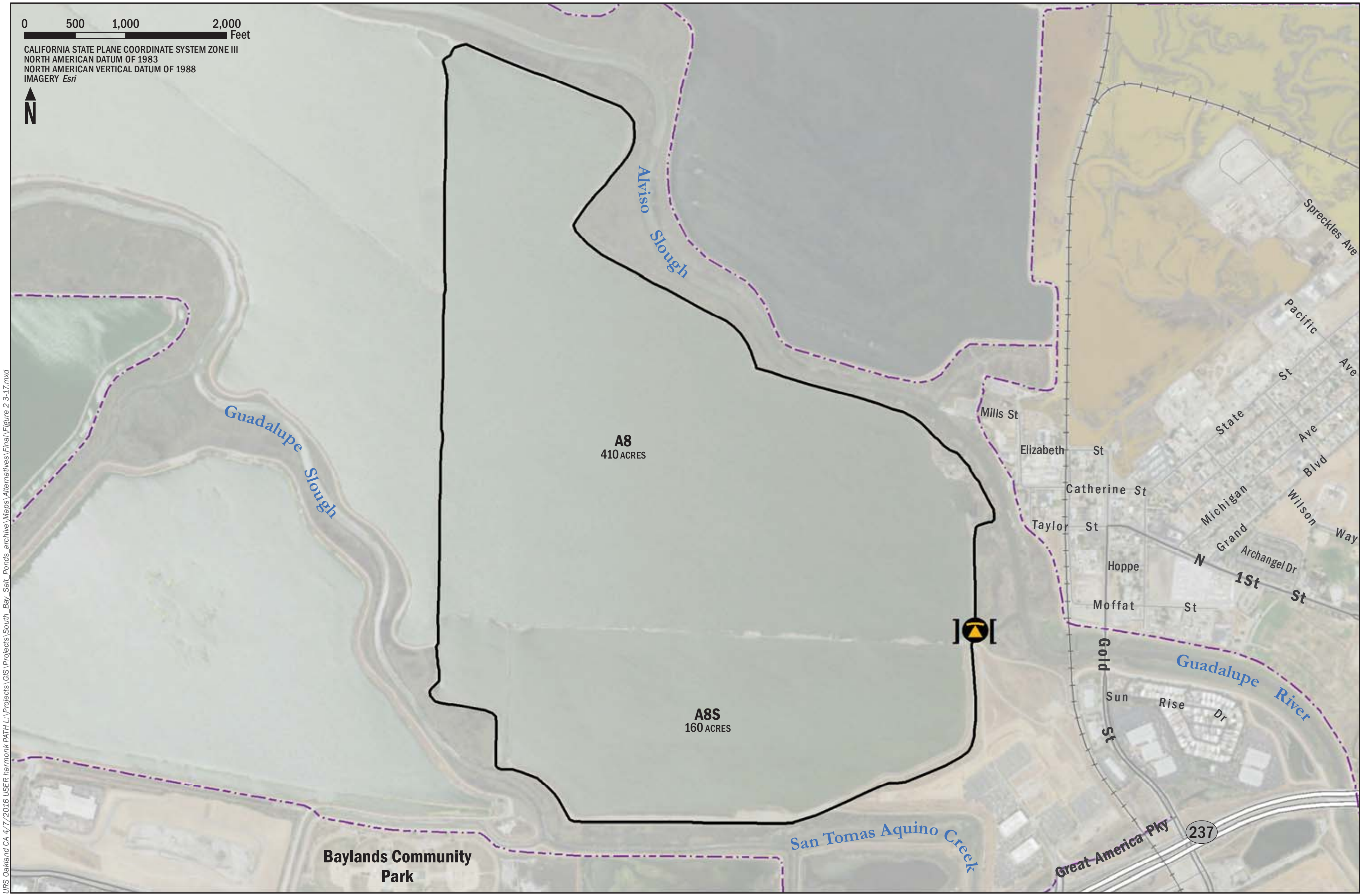
Ponds A8 and A8S are configured and managed such that they can also be used as flood storage basins during high-rainfall events. Pond A8 contains an overflow weir. During flood events greater than a 10-year flood in the lower Guadalupe River and Alviso Slough, water can overflow into Pond A8 for initial flood storage. Recreation and public access features at these ponds themselves are limited to a hunter check-in station and a small boat launch area along the western side.

Under Alternative A8 A (No Action), no new activities would occur under Phase 2. The Action Alternative (Alternative A8 B) would involve the placement of upland fill material to form habitat transition zones in the southwestern and southeastern corners of Pond A8S. All material used for the habitat transition zones would be sampled and screened for compliance with cleanliness requirements. The screening would be conducted in accordance with the new QAP being developed for the Bair Island Restoration Project by Life Sciences, Inc. That QAP includes protocols for off-site imported material testing, classification, and tracking. No other Phase 2 actions are planned for this pond cluster.

Details about each Phase 2 alternative for this pond cluster are illustrated on Figures 2-11 through 2-13 and described in the sections below. The Preliminary Design Memorandum for the Action Alternatives for the A8 Ponds is included as Appendix N to this Final EIS/R.

Alternative A8 A (No Action)

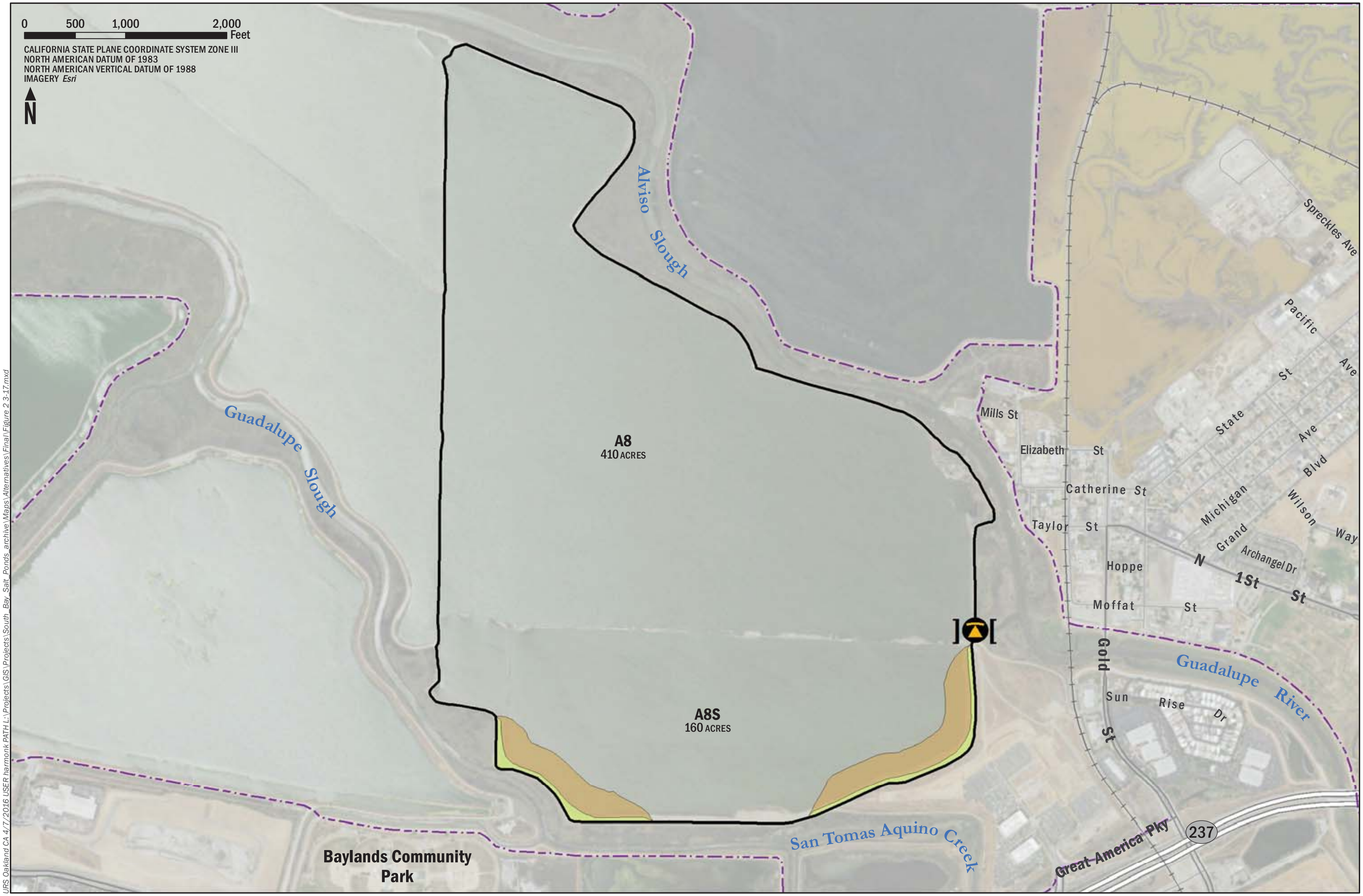
Under Alternative A8 A, the No Action Alternative, the USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish entrainment and maintain existing levels of flood protection; inspections of pond infrastructure to ensure the pond is operating as intended, tidal connectivity is achieved as intended, and water quality requirements are being met; monitoring of restoration performance. This alternative is shown on Figure 2-11.



LEGEND

- Existing reversible armored notch
- Existing trail
- Pond boundary

Figure 2-11
Alternative A8 A



LEGEND

Existing reversible armored notch

Existing trail

Pond boundary

Habitat Transition Zone

High marsh habitat

Intertidal habitat

AECOM

South Bay Salt Pond Restoration Project

Figure 2-12

Alternative A8 B

Alternative A8 B

Alternative A8 B proposes the construction of habitat transition zones in Pond A8S's southwest corner, southeast corner, or both, depending on the amount of material available. This document assumes both are constructed and analyzes the impacts associated with that assumption. The habitat transition zones would perform several functions: adding some flood protection, adding transitional habitat for salt marsh harvest mouse and Ridgway's rail, and protecting the adjacent landfill. The transition zone features would not affect the existing hunting access feature, which is further to the west. This alternative is shown on Figure 2-12.

Up to 1,400 linear feet of habitat transition zone would be established along the southwest corner of perimeter levee of Pond A8S, and up to 1,500 linear feet of habitat transition zone would be established along the southeast corner of perimeter levee of Pond A8S. The habitat transition zones for Alternative A8 B would be constructed of approximately 190,000 cubic yards of upland fill material, as shown in Table 2-3 would extend into the center of the pond at a slope of 30:1 (h:v) or steeper, and would start at elevation 9.0 feet NAVD88. Additional detail on the grading and extent of the transition zones has corrected the initial estimate of the volume of fill to build those features over that which was presented in the Draft EIS/R. Also, the top elevation of the transition zones has since been raised to 9.0 feet NAVD88. Together, these two adjustments have increased the volume of material that is needed to construct the transition zones. The corrected and updated material volume estimate is presented here and throughout this Final EIS/R. In the designs presented as Appendix N, the tops of these habitat transition zones were set at elevation 7.5 feet NAVD88.

Construction Methods

Construction would include earth-moving activities at the pond levees and within the southern end of the pond to construct habitat transition zones in the southeastern and southwestern corners of Pond A8S.

Habitat Transition Zone. Habitat transition zones would be constructed by placing fill material along the slopes and compacting to 70–80 percent density to enable vegetation establishment. Slope protection would be maintained by establishment of native vegetation. Hydroseeding or other seeding method with a native plant mix, development of a planting scheme, and invasive plant control would aid in establishing desirable vegetative habitat.

Construction Access. As shown on Figure 2-13, access to the A8 Ponds (Ponds A8 and A8S) would be from Gold Street or America Center Road near the southeast corner of Pond A8S and the levee crests along the perimeter levees. The ponds would be accessed by haul trucks using existing roadways and levee roads. No work would occur on the pond levees or within the ponds. Construction crews would typically consist of five to ten people. The existing levees are known to be capable of handling heavy construction equipment and trucks carrying dirt because the Santa Clara Valley Water District (SCVWD) uses these access roads to import material dredged from creek channels in Santa Clara County.

Construction Staging Areas. A staging area would be established for equipment and possible material stockpiling. The location would be within the hard-pack access and turnaround areas that exist within the landfill access areas or within the construction area along the southern border of Pond A8S.

Construction Equipment. Construction equipment would include haul trucks, bulldozers, water trucks, compaction rollers, other construction equipment, and vehicles for transportation in and out of the project site.

URS Oakland CA 4/6/2016 USER arakis PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-13 Alviso-A8 Ponds Access.mxd

LEGEND

Access Route

Phase II Project Area

AECOM
South Bay Salt Pond Restoration Project

Figure 2-13
Alvisio-A8 Ponds Access Route

Construction Timing Considerations. There are certain special-status species that may be affected by construction activities. The presence of these species may limit construction activities or require certain avoidance and minimization measures. The specific limits and requirements for each species and their habitats will be addressed during the permitting phase of the project. However, the timing considerations below will be incorporated into detailed designs and project planning to reduce the overall potential for adverse impacts and the need for mitigation.

- Bird nesting: Regulatory work windows for bird nesting typically run from February 1 through September 15. Work could likely occur within this window in the presence of a biological monitor and preconstruction surveys.
- Steelhead migration: Activities that may potentially affect adult upstream migration would be avoided from December through February. Similar avoidance of activities that would affect juvenile downstream migration would be avoided from April through June. If applicable, the National Marine Fisheries Service (NMFS) acceptable work windows for steelhead are June through November; a USFWS-approved biological monitor may be required during this period.
- Longfin smelt and green sturgeon: These species could be present year-round. In-channel work may require that a USFWS-approved biological monitor be present.

Construction Schedule. The project would begin in summer of 2017, depending on the material available for use in the Alviso-A8 Ponds or in other Phase 2 project ponds. If sufficient quantities of material are available, construction of habitat transition zones would take approximately 8 months in one construction season.

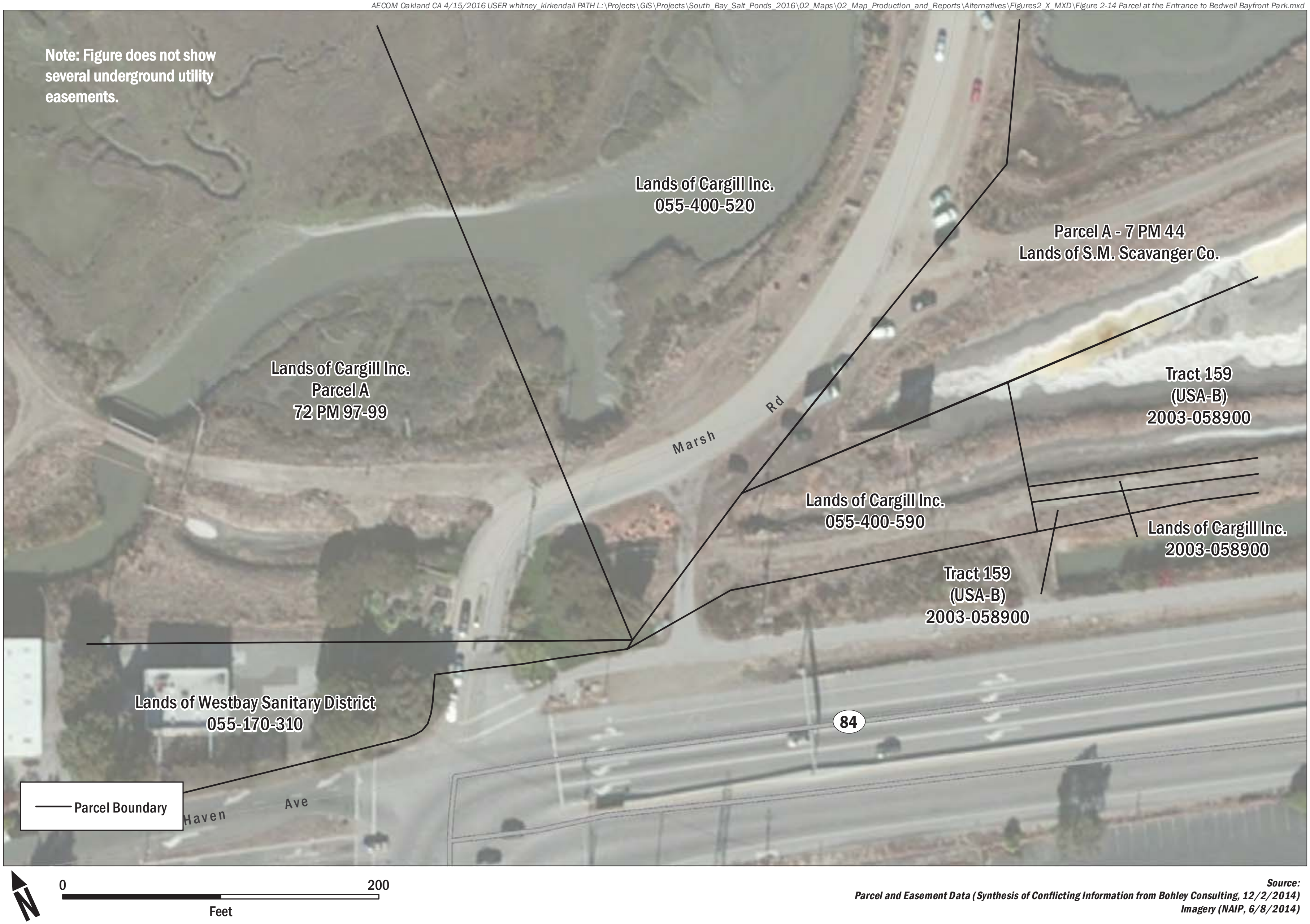
Operations and Maintenance

The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These ongoing management practices would not change during or after the construction activities described above.

2.2.5 Ravenswood Pond Cluster

The Phase 2 Ravenswood pond cluster consists of Ponds R3, R4, R5, and S5; the levees surrounding each pond; some of the fringe marsh outside of these levees; and the All-American Canal (AAC). The pond cluster is bordered by Menlo Park’s Bedwell Bayfront Park to the west, State Route (SR) 84 and the city of Menlo Park to the south, Ravenswood Slough to the east, and Greco Island and open bay water to the north. A small triangular pond is to the immediate west of Pond S5. This pond is unnamed and is labeled or described in various documents in three different ways: part of Pond S5, a separate but unnamed pond, or as the forebay of Pond S5. This document treats it as part of Pond S5 and frequently refers to it as the forebay.

There are a number of complicated easements as well as several different landowners in the area where Flood Slough, the Pond S5 forebay, SR84, Marsh Road, Bedwell Bayfront Park, and the driveway into the park, all come together. Figure 2-14 illustrates the most current information available to the SBSP Restoration Project. It shows the various parcels and their owners, as well as easements for utilities or access. Cargill holds fee title on much of Flood Slough and has a 10-foot wide pipeline strip of property



Source:
Parcel and Easement Data (Synthesis of Conflicting Information from Bohley Consulting, 12/2/2014)
Imagery (NAIP, 6/8/2014)

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FIGURE 2-14

Parcels at the Entrance to Bedwell Bayfront Park along the entire southern border of Ponds S5 and R3. Cargill's coordination and approval would be required for any proposed activities that would take place on, cross, or otherwise affect lands or properties it owns or to which it holds fee title. This includes proposed additions of fencing, building a trail that would cross Cargill's pipeline easement, and connecting Flood Slough to the S5 forebay. Similar statements would apply to the City of Menlo Park and the West Bay Sanitary District, which are also landowners, and to the California Department of Transportation and other holders of utility easements.

Under Alternative Ravenswood A (No Action), no new activities would be implemented as part of Phase 2. Alternatives Ravenswood B, Ravenswood C, and Ravenswood D propose activities that would initiate the transition of Pond R4 from a seasonal pond to tidal marsh while maintaining or improving the existing flood protection and the conversion of Ponds R5 and S5 from seasonal ponds to a variety of enhanced managed pond habitat types.

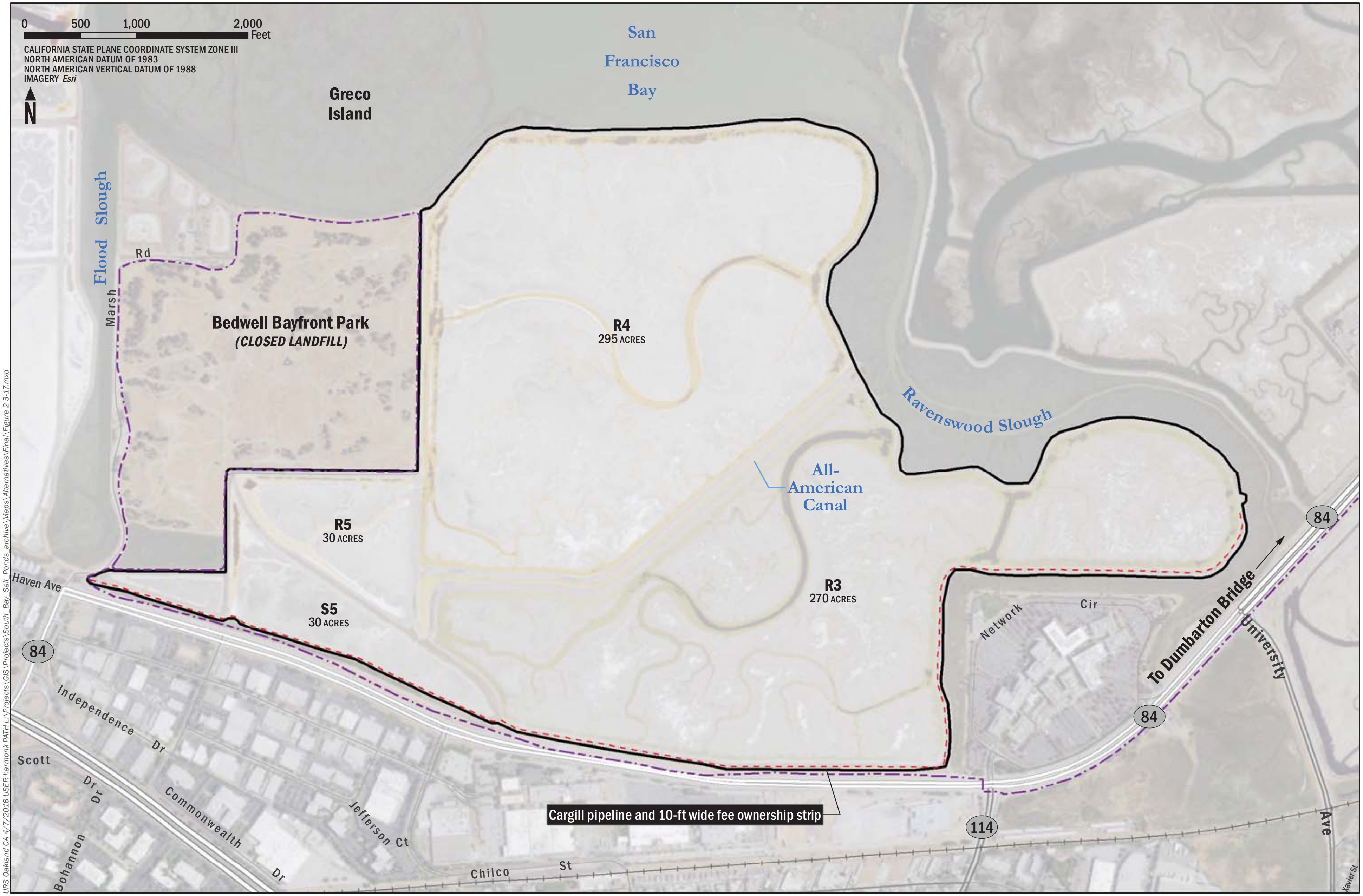
In Pond R3, the existing western snowy plover (*Charadrius alexandrinus nivosus*) habitat would be improved by adding a water control structure to improve water circulation (and thus forage quality) within the pond. The habitat features and improvements targeted for western snowy plover are included in Phase 2 at the Ravenswood Ponds because those ponds have been the location of the most snowy plover nests in the west bay in recent years, and the SBSP Restoration Project is attempting to provide restoration balance across a range of types of locations in all three pond complexes. Building upon recent nesting success in these areas is a rational approach that has more potential to succeed than others.

Upland fill material would also be placed in ponds to construct habitat transition zones in these ponds and enhance levees around them. All material used for the habitat transition zones would be sampled and screened for compliance with cleanliness requirements. The screening would be conducted in accordance with a new QAP being developed for the Bair Island Restoration Project by Life Sciences, Inc. That QAP includes protocols for off-site imported material testing, classification, and tracking. Up to several hundred thousand cubic yards of fill in the form of appropriate upland material would be imported and used in Ponds R4, R5, or S5 to enhance levees, fill borrow ditches, and build the habitat transition zone. The majority of any imported fill material would be used for habitat transition zone and levee improvements; therefore, the information needed to assess the impacts of accepting and placing fill material is included in those parts of this project description.

There was also a possibility for beneficial reuse of dredged material to fill borrow ditches or to construct habitat transition zones or improve levees. However, these actions are not currently part of the project planning, and the impacts of delivering and placing that material are not analyzed here. Beneficial reuse of dredged material at the Ravenswood pond complex would only take place if the impact analysis and associated NEPA and CEQA processes (including a supplemental/addendum EIS/R or a full EIS/R tiered from this document and the 2007 programmatic EIS/R) and other regulatory or permitting issues were performed by the source or provider of that material.

Viewing platforms and trails would be established to improve recreation and public access to the pond cluster. Details about each Phase 2 alternative for this pond cluster are described below.

Details about each Phase 2 Action Alternative for this pond cluster are summarized in Table 2-5, illustrated on Figures 2-15 through 2-20, and described in the following sections. The Preliminary Design Memorandum for the Action Alternatives for the Ravenswood Ponds is included as Appendix O to this Final EIS/R.



URS Oakland CA 4/7/2016 USER harmonk PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_archive\Maps\Alternatives\Final\Figure 2 3-17.mxd

LEGEND

- Existing trail
- Cargill pipeline
- Pond boundary

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Figure 2-15
Alternative Ravenswood A

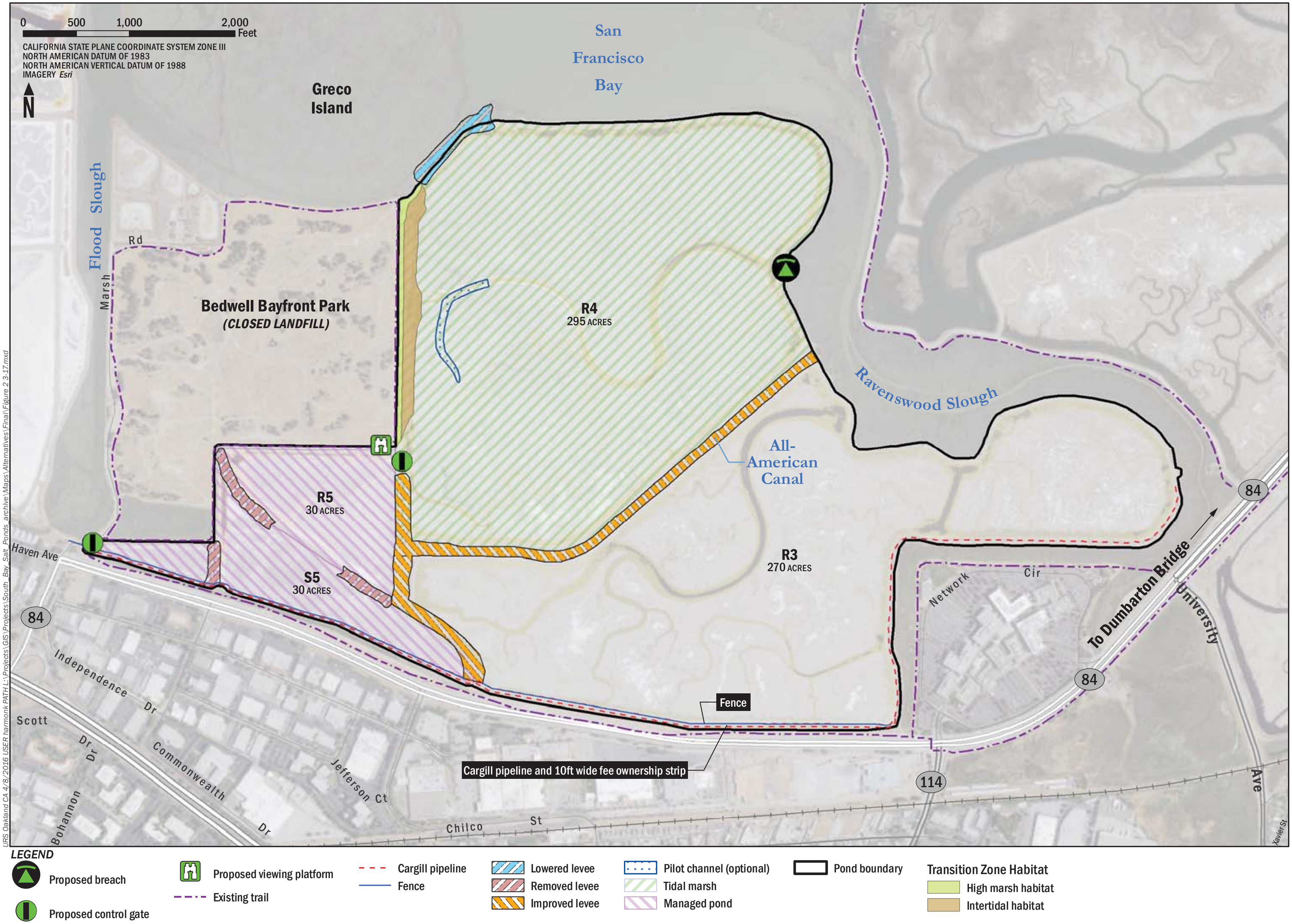
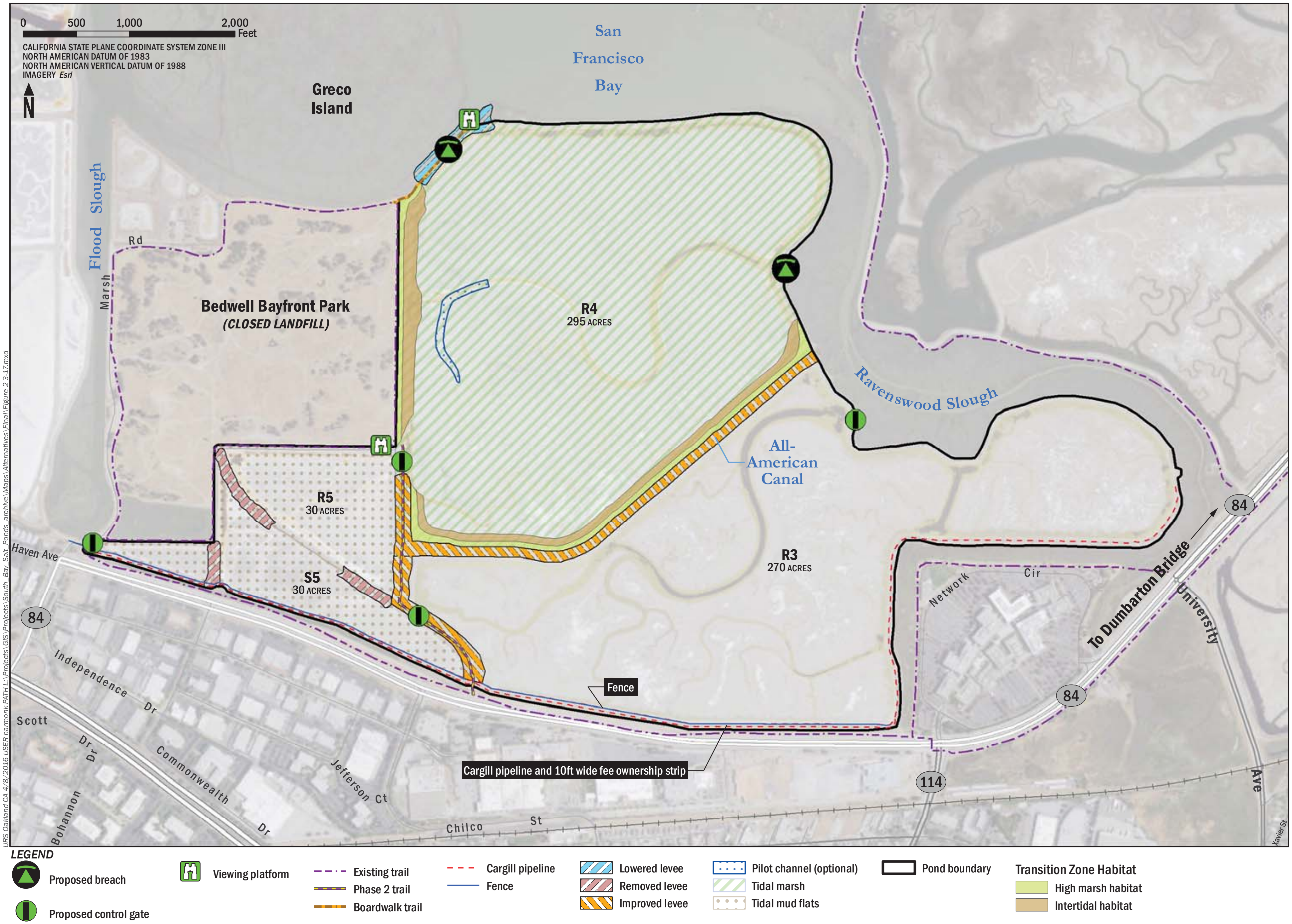


Figure 2-16
Alternative Ravenswood B



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South Bay Salt Pond Restoration Project

Figure 2-17
Alternative Ravenswood C

LEGEND

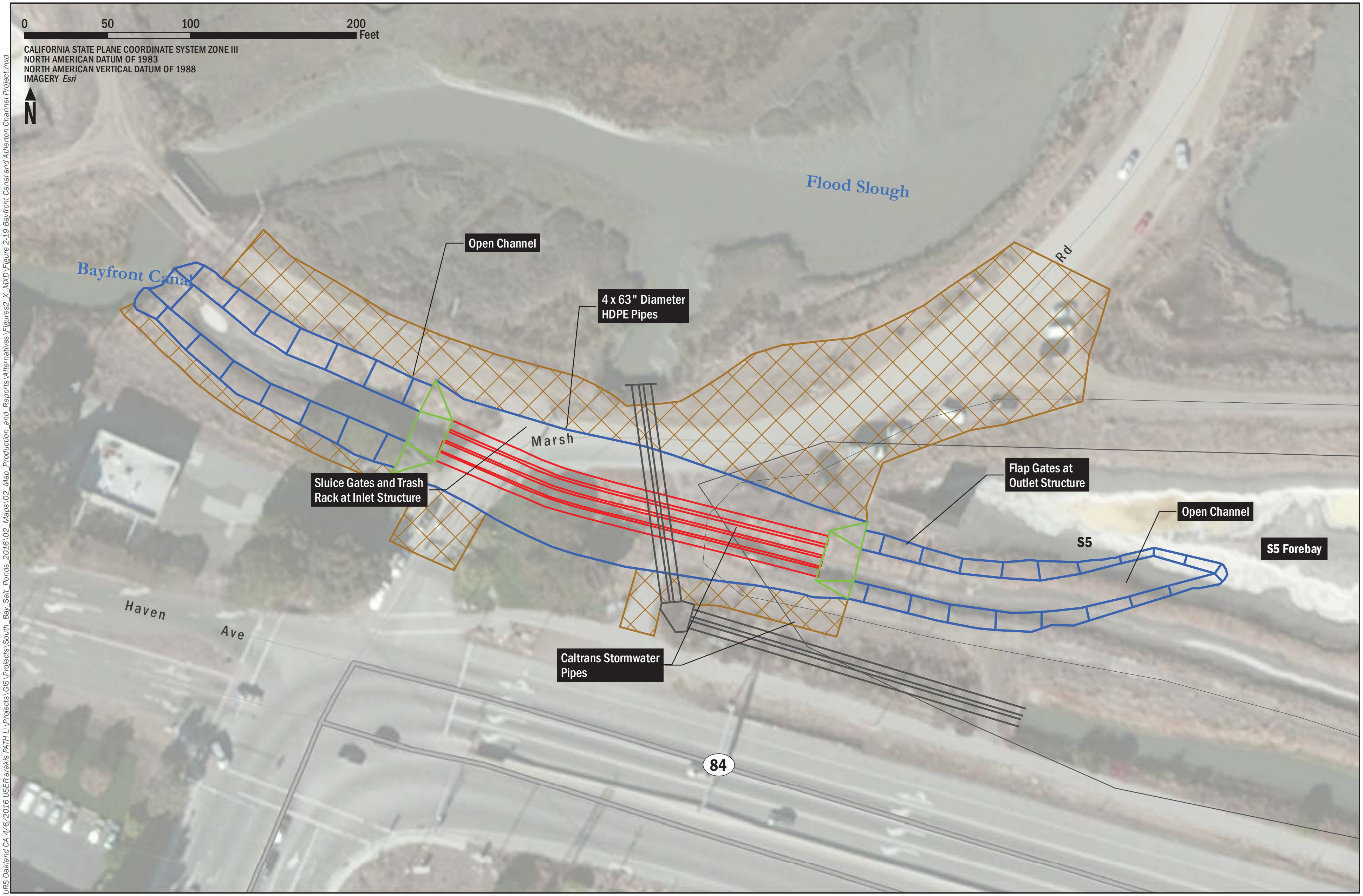
Proposed breach
Proposed control gate
Viewing platform
Existing trail
Phase 2 trail
Cargill pipeline
Fence
RWC Stormwater Project*
Removed levee
Improved levee
Tidal marsh
Managed pond
Pond boundary

Transition Zone Habitat
High marsh habitat
Intertidal habitat

*Pending property rights/easements

AECOM
South Bay Salt Pond Restoration Project

Figure 2-18
Alternative Ravenswood D



URS Oakland CA 4/6/2016 USER arakis PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-19 Bayfront Canal and Atherton Channel Project.mxd

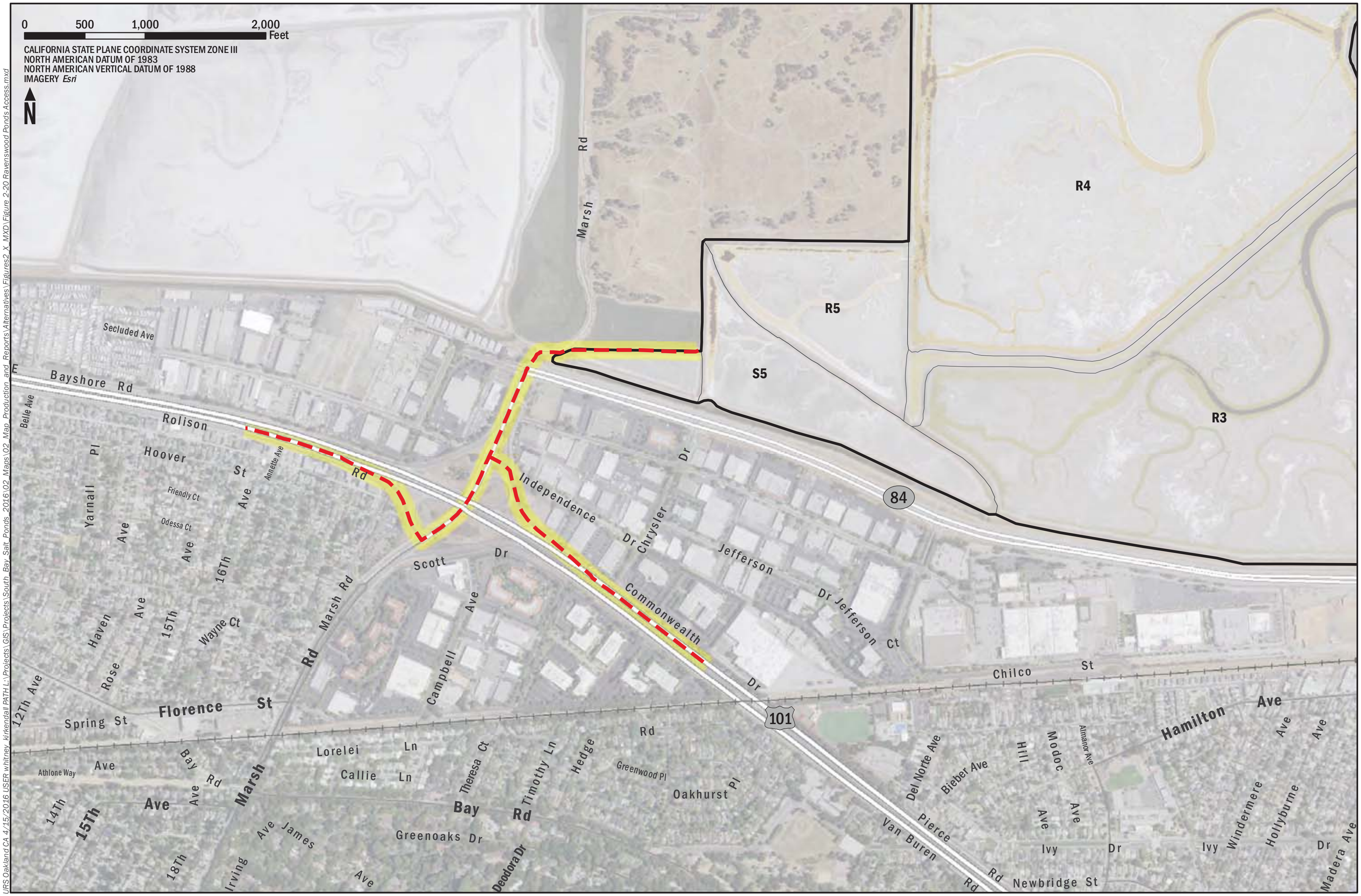
LEGEND

- Proposed new pipes
- Proposed grading boundary
- Caltrans culvert
- Staging areas
- Proposed concrete structures

AECOM
South Bay Salt Pond Restoration Project

Figure 2-19
Bayfront Canal and Atherton Channel Project

URS Oakland CA 4/15/2016 USER whitney_kirkendall PATH L:\Projects\GIS\Projects\South_Bay_Salt_Ponds_2016\02_Maps\02_Map_Production_and_Reports\Alternatives\Figures2_X_MXD\Figure 2-20 Ravenswood Ponds Access.mxd



LEGEND

Access Route

Phase II Project Area

AECOM
South Bay Salt Pond Restoration Project

Figure 2-20
Ravenswood Ponds Access Route

Table 2-5 Components of the Phase 2 Action Alternatives at the Ravenswood Ponds

ALTERNATIVE RAVENSWOOD B	ALTERNATIVE RAVENSWOOD C	ALTERNATIVE RAVENSWOOD D
Improve All-American Canal levee	Improve All-American Canal levee	Improve All-American Canal levee
—	All-American Canal habitat transition zone	All-American Canal habitat transition zone
Bedwell Bayfront Park habitat transition zone	Bedwell Bayfront Park habitat transition zone	—
—	—	Pond R4 Northwest habitat transition zone
Remove parts of Ponds R5 and S5 internal levees	Remove parts of Ponds R5 and S5 levees	Remove all of Ponds R5 and S5 internal levees
—	Grade and partially fill Ponds R5/S5	—
Ponds R4/R5 water control structure	Ponds R4/R5 water control structure	Ponds R4/R5 water control structure
—	Ponds R3/S5 water control structure	Ponds R3/S5 water control structure
Pond R3/Ravenswood Slough water control structure	Pond R3/Ravenswood Slough water control structure	Pond R3/Ravenswood Slough water control structure
—	—	Connect to Bayfront Canal and Atherton Channel Project
Pond S5/Flood Slough water control structure	Pond S5/Flood Slough water control structure	Pond S5/Flood Slough water control structure
Pond R4 pilot channel	Pond R4 pilot channel	—
Pond R4 east breach	Pond R4 east breach	Pond R4 east breach
—	Pond R4 northwest breach	—
Lower Pond R4 northwest levee	Lower Pond R4 northwest levee	—
Ponds R5 and S5 bird habitat island	Ponds R5 and S5 bird habitat island	—
Viewing platform near Pond R5	Viewing platform near Pond R5	Viewing platform near Pond R5
—	Pond R4 boardwalk trail at northwest corner	Pond R4 trail on northwest levee
—	Pond R4 viewing platform	Pond R4 viewing platform
—	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail

Alternative Ravenswood A (No Action)

Under Alternative Ravenswood A, the No Action Alternative, no new activities would be implemented as part of Phase 2. The USFWS would maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge system following the AMP and other management practices. The Ravenswood pond cluster would continue to be managed through the activities described in the AMP. Ponds R3, R4 and R5/S5 would function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would continue to be maintained or repaired as a component of the 2009 USACE operations and maintenance (O&M) permit. Trails of the adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, would continue to be used and maintained separately.

The components of Alternative Ravenswood A are illustrated on Figure 2-15.

Alternative Ravenswood B

Alternative Ravenswood B would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create habitat transition zone along the western edge of Pond R4, establish managed ponds to improve habitat for diving and dabbling birds, increase pond connectivity, and improve recreation and access. Surplus upland fill material (after completing the habitat transition zone and improving levees) would be used to fill borrow ditches and speed tidal marsh restoration. The estimated volume of earth cut, fill, and net import for Alternative Ravenswood B is listed in Table 2-3.

The components of this alternative are described in detail below and illustrated on Figure 2-16:

- Breach the eastern side of Pond R4. Construct a breach along the eastern levee of Pond R4 at a historic slough trace to open the pond to tidal flows from Ravenswood Slough. Material from the breached levee would be used to fill borrow ditches or construct habitat transition zone. The bottom width of this breach would be 150 feet, with an invert elevation of 2.0 feet NAVD88. The top width is estimated to be approximately 200 feet with side slopes of 3:1 (h:v).

- Improve levees along the All-American Canal. Approximately 4,700 feet of levees along the AAC would be improved. The berm-like levees along one or both sides of the ACC would be raised, widened, and strengthened to replace the flood protection currently provided by the outboard levees on Pond R4 to SR 84. Improvements at the western end of the AAC would extend north along the Ponds R4/R5 border. These activities would build up the levee on the north side of the AAC and extend it farther into Pond R4. This decision would be based in part on the amount of material available. Material for the improvements would come from off-site sources. The improved levee would consist of a 10-foot-wide crest with side slopes ranging from 4:1 (h:v) along the southern levee slope to 8:1 (h:v) along the northern slope extending into Pond R4. The crest of the levee would be at elevation 10.0 feet NAVD88.

- Construct a habitat transition zone in Pond R4. Construct a habitat transition zone beginning in the northwestern corner of Pond R4 and extending down the pond's internal western edge to provide habitat. The habitat transition zone would be 2,300 feet long on the west perimeter levee of Pond R4 bordering Bedwell Bayfront Park (a closed landfill). The habitat transition zone would start at an elevation of 9.0 feet along the levees or the high ground of the park and have side slopes ranging from 15:1 (h:v) to 30:1 (h:v). The habitat transition zone would be constructed primarily of upland fill material brought in from off-site locations.

- Water control structure for Pond R3. A water control structure (included and described in Table 2-6) would be installed at the eastern levee of Pond R3 where the historical slough trace intersects with Ravenswood Slough. This water control structure would allow direct control and management of the water levels in the pond to provide for the improvement of the existing western snowy plover habitat in Pond R3.

- Excavate a pilot channel in Pond R4. Portions of the bottom of Pond R4 would be modified to direct the new tidal flows (introduced by the levee breach) into the interior of the pond by creating and extending pilot channels in former slough traces. The proposed pilot channel would be roughly 1,500 feet long and would be excavated through the existing pond bed. The invert elevation would be at 2.0 feet NAVD88 to roughly match the invert elevation of the existing channels within Pond R4. The bottom width would be roughly 50 feet wide with side slopes of

3:1 (h:v). The moved material would be used to enhance levees, fill borrow ditches, and construct ditch blocks.

- Lower the levee in the northwest corner of Pond R4 near Greco Island. Approximately 1,000 linear feet of the northwestern levee on the edge of Pond R4 that borders Greco Island would be lowered to MHW. This modification would provide habitat connectivity between Pond R4 and Greco Island and high-tide refugia for salt marsh harvest mouse and other species. The levee would be designed for the highest tides to spill over the levee into Pond R4, thus speeding the rate of sediment accretion. The new MHW elevation would be 6.6 feet NAVD88. Material from the lowered levee would be used to fill borrow ditches or construct a habitat transition zone.

- Convert Ponds R5 and S5 to fully managed ponds. Ponds R5 and S5, which are currently seasonal managed ponds, would be converted into enhanced managed ponds through removal or modification of levees within and between the ponds, the construction of water control structures, creation of a habitat island, and specific operational techniques. To allow for improved habitat diversity, the levee between Ponds R5 and S5 would be modified, and the levee within Pond S5 (i.e., between the forebay and the main part of Pond S5) would be removed to an elevation of 4.5 feet NAVD88 to match the surrounding pond bottoms.

  A water control structure would be installed at the levee between Ponds R4 and R5, and a second such structure would be installed between Pond S5 and the Flood Slough. By providing the means for year-round control of water levels and some control of the salinities of the ponds, this modification would allow for the creation of managed pond habitat for birds with maintained bottom depths at subtidal elevations. Water would also flow into Pond R4 as needed for flood control or other management purposes.

  The water control structures would include prefabricated concrete box culverts or circular HDPE or corrugated metal pipe (CMP) through the levee and with headwalls, as required. The number, size, and invert elevations of the water control structures that would be installed at proposed locations around the project site, depending on the types that are chosen, are listed in Table 2-6. The water control structures would be gated at the inlet and/or outlet.

Table 2-6 Water Control Structure Details for the Ravenswood Action Alternatives

WATER CONTROL STRUCTURE	ALTERNATIVE(S)	(NUMBER), SIZE, TYPE	INVERT ELEVATION, FEET (NAVD88)
Ponds R4/R5	Ravenswood B, C, and D	One 4-foot x 4-foot concrete box culvert or 30-inch-diameter HDPE/CMP, 100 feet long	Pond R4: 4.9; Pond R5: 5.4
Pond S5/Flood Slough	Ravenswood B, C, and D	Three 4-foot x 8-foot concrete box culvert or 40-inch-diameter HDPE/CMP, 200 feet long	Pond R5: 5.4; Flood Slough: 4.9
Pond R3/Ravenswood Slough	Ravenswood B, C, and D	One 36-inch-diameter culvert, 400 feet long	4.9
Ponds R3/S5	Ravenswood C and D	One 4-foot x 4-foot concrete box culvert or 30-inch-diameter HDPE/CMP, 150 feet long	Pond R3: 4.9; Pond R5: 5.4

- Construct a habitat island between Ponds R5 and S5. A habitat island would be created between Ponds R5 and S5 from the remnants of the internal levee currently between those ponds. The island would be modified to optimize its usefulness as upland wildlife habitat. The habitat island would be approximately 17,800 square feet in area with a relatively flat top surface at elevation 9 feet NAVD88 (above the MHHW elevation) with side slopes of 5:1 (h:v) down to the adjacent pond bottom. Sand, shell, or other suitable topping would be added to the island to enhance its usefulness for the birds that would use it and to help control invasive vegetation.

- Additional recreation and public access. A viewing platform would be constructed along an existing trail near Ponds R5 and S5. The exhibit would include signage on a pedestal and would improve public access and supplement the benefits available at the adjacent wildlife habitat in Ponds R5 and S5. A bench would be located near the exhibit's signage. This action would allow the public to enhance the recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park by incorporating the interpretive opportunities at these ponds.

- Fence the southern border of Ponds R3 and S5. A low (3-foot-high) chain-link fence would be installed inside the Refuge property and adjacent to the existing Cargill Inc. (Cargill) pipeline property, north of the Bay Trail. The purpose of the fence is to deter people and their pets from leaving the trail and entering the restored habitat there. The fence would also help keep trash from blowing into the ponds and keep chicks from straying from Pond R3 onto the paved trail and roadway to the south.

Alternative Ravenswood C

Alternative Ravenswood C would be similar to Alternative Ravenswood B with the following exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond that is maintained at mud flat elevation for shore birds; water control structures would be installed on Pond R3 to allow for improvement to the habitat for western snowy plover; an additional habitat transition zone would be constructed; and additional recreational and public access components would be constructed. The estimated volume of earth cut, fill, and net import for Alternative Ravenswood C is listed in Table 2-3. The components of this alternative are described in detail below and are illustrated on Figure 2-17.

- Alternative Ravenswood B activities. Alternative Ravenswood C would include many but not all of the activities from Alternative Ravenswood B. Exceptions and differences are noted in the list that follows.

- Breach Pond R4 at two locations. The northwestern levee of Pond R4 at the corner of the pond near the narrow waterway separating Pond R4 from Greco Island would be breached (in addition to the eastern breach outlined in Alternative Ravenswood B). This breach would be 40 feet wide at the bottom with an invert elevation of 3.0 feet NAVD88. The top width would be approximately 100 feet with side slopes of 3:1 (h:v). The breaches would open the pond to tidal flows. Material from the breaches would be used to fill borrow ditches or construct habitat transition zones.

- Construct two habitat transition zones in Pond R4. One habitat transition zone, of approximately 5,100 linear feet, would be constructed to extend northward into Pond R4 from the improved AAC levee. The second habitat transition zone would begin in the northwestern corner of Pond R4 and extend down the internal western edge of the pond, for about 2,300 feet, abutting the levee separating Pond R4 and the Bedwell Bayfront Park. The northern terminus of the second habitat transition zone would be designed and built to accommodate the proposed breach and the lowering of the northwestern levee of Pond R4 that is described above. The habitat transition zones would be constructed primarily of upland fill material and would start at elevation 9.0 feet along the levees and have side slopes ranging from 15:1 (h:v) to 30:1 (h:v).

- Convert Ponds R5 and S5 to managed ponds at tidal mud flat elevations. Ponds R5 and S5 would be converted into enhanced year-round managed ponds to deliver regular flows through the removal or modification of levees within and between the ponds, construction of water control structures, creation of islands, and specific operational techniques. The levee between Ponds R5 and S5 and the levee within Pond S5 would be removed, and additional fill would be used to raise the overall pond bottom elevations. These actions would create a relatively flat area that would receive regular flows via water control structures at the boundary with Pond R4 and between Pond S5 and Flood Slough. Preliminary hydraulic modeling results indicate that the bottom of Ponds R5 and S5 would need to be elevated to between 5 and 6 feet NAVD88 to drain the pond completely. The existing pond bottoms would be raised to an average elevation of 5.25 feet by placing approximately 0.5 feet of fill within the ponds. These activities would allow for these ponds to be maintained with the pond bottoms at an intertidal elevation to form mud flats for foraging shorebirds. Water could also be controlled to flow into Pond R4 as needed for water quality maintenance or other management purposes.

  Water control structures would be installed in the levees between Ponds R4 and R5 and between Pond S5 and Flood Slough. The structures would include prefabricated concrete box culverts or circular HDPE or CMP through the levees and with headwalls, as required. The number, size, and invert elevations of the water control structures installed, depending on the types chosen, are listed in Table 2-6. The water control structures would be gated at the inlet and/or outlet. The operational techniques are described in detail in the “Operations and Maintenance: All Action Alternatives” section for this alternative (below).

- Water control structures for Pond R3. Two water control structures (included and described in Table 2-6) would be installed on Pond R3: one on the eastern levee of Pond R3 where the historical slough trace intersects with Ravenswood Slough and one on the levee border between Ponds R3 and S5. Alternative Ravenswood B only had the latter of these. These water control structures would allow direct control and management of the water levels in the pond to provide for the improvement of the existing western snowy plover habitat in Pond R3.

- Complete Ponds R5 and S5 loop trail. A trail along the eastern levees of Ponds R5 and S5 would be constructed and linked to the existing trails outside of these ponds. This trail would be approximately 2,700 feet long, 6 feet wide, and would likely require some levee improvements between Ponds R3 and R5 and between Ponds R3 and S5. Surfacing materials would be decomposed granite with timber or concrete edging. The proposed water control structures between Ponds R4 and R5 and between Ponds R3 and S5 would be set low enough to allow trail construction. This trail would necessitate a break in the fence with a gate and appropriate signage along the southern border of Ponds R5 and S5 where it leaves the Refuge and connects to the Bay Trail.

- Spur trail and viewing platform on Pond R4. A spur trail and viewing platform would be constructed along the northwestern corner of Pond R4. Because this portion of the Pond R4 levee would be breached and lowered, the trail would be placed on a slightly elevated boardwalk above the levee. The boardwalk trail would begin at the northeast corner of the Bedwell Bayfront Park and extend approximately 600 feet to the northeast above the lowered and breached levee. The viewing platform would be constructed at the northern terminus of the trail. The boardwalk and viewing platform would be approximately 8 feet wide and approximately 600 feet long with anti-perch railings to reduce predator perching.

- Fence the southern border of Ponds R3 and S5. A low (3-foot high) chain-link fence would be installed inside the Refuge property and adjacent to the existing Cargill pipeline property, north of the Bay Trail. The purpose of the fence is to deter people and their pets from leaving the trail and entering the restored habitat. The fence would also help keep trash from blowing into the ponds and keep chicks from straying from Pond R3 onto the paved trail and roadway to the south.

Alternative Ravenswood D

Alternative Ravenswood D would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create two habitat transition zones in Pond R4, establish enhanced managed ponds in Ponds R5 and S5, increase pond connectivity, enhance Pond R3 for western snowy plover habitat, remove the levees within and between Ponds R5 and S5, and improve recreation and public access. Alternative Ravenswood D would also allow stormwater outflow from Redwood City and other surrounding communities (including parts of Menlo Park, Atherton, and unincorporated San Mateo County) to flow into Ponds R5 and S5 (via connections with the Bayfront Canal and Atherton Channel), including open channel improvements, installation of a system of pipes or culverts, temporary removal of California Department of Transportation (Caltrans) stormwater pipes, and installation of a water control structure. This alternative would address a problem with residual salinity in Ponds S5 and R5 and would reduce flood risk in the neighborhood to the southwest. The estimated volume of earth cut, fill, and net import for Alternative Ravenswood D is listed in Table 2-3. These actions are described in detail below and are illustrated on Figure 2-18.

- Alternative Ravenswood B and C activities. Alternative Ravenswood D includes many but not all of the activities from Alternatives Ravenswood B and C. Exceptions and differences are noted in the list that follows.

- Improve the AAC levees. As in Alternatives Ravenswood B and C, the levees around the AAC would be improved and raised to maintain current levels of flood protection.

- Breach the eastern side of Pond R4. This action would be in the same location and have the same dimensions as the breach described for Alternative Ravenswood B.

- Construct two habitat transition zones in Pond R4. One habitat transition zone would be identical to that described for Alternative Ravenswood C. It would be approximately 5,100 feet and would extend northward into Pond R4 from the improved AAC levee. The second habitat transition zone would be placed in the northwestern corner of Pond R4 abutting the levee separating Pond R4 from Greco Island. Its length would be about 2,300 feet. The habitat transition zone would be constructed primarily of upland fill material and would start at elevation 9.0 feet along the levees and have side slopes ranging from 15:1 (h:v) to 30:1 (h:v).

- Spur trail and viewing platform on Pond R4. A spur trail and viewing platform would be constructed along the northwestern corner of Pond R4. Unlike in Alternative Ravenswood C, where the levee is lowered, the trail would be on the levee itself and not on an elevated boardwalk. The trail would begin at the northeast corner of the Bedwell Bayfront Park and extend approximately 1,200 feet. The viewing platform would be constructed at the northern terminus of the trail. The trail and viewing platform would be approximately 8 feet wide and approximately 600 feet long with anti-perch railings to reduce predator perching.

- Water control structures for Pond R3. As in Alternative Ravenswood C, two water control structures would be added to Pond R3 to improve the ability of the USFWS to manage the pond for western snowy plover habitat. These structures are listed in Table 2-6 and described in the text for Alternative Ravenswood C.

- Fence the southern border of Ponds R3 and S5. A low (3-foot high) chain-link fence would be installed inside the Refuge property and adjacent to the existing Cargill pipeline property, north of the Bay Trail. The purpose of the fence is to deter people and their pets from leaving the trail and entering the restored habitat there. The fence would also help keep trash from blowing into the ponds and keep chicks from straying from Pond R3 onto the paved trail and roadway to the south.

- Convert Ponds R5 and S5 to enhanced managed ponds. Ponds R5 and S5 would be converted into enhanced managed ponds through the removal of levees within and between the ponds, excavation to deepen the ponds, installation of water control structures, and specific operational techniques. The operational techniques for this alternative are described in detail in the "Operations and Maintenance: All Action Alternatives" section (below). Approximately 2,230 linear feet of levees between Ponds R5 and S5 and within Pond S5 (between the forebay and the main part of the pond) would be removed to 3.0 feet NAVD88 to increase the capacity of these ponds for salinity treatment and temporary stormwater detention.

  Two water control structures would be installed as part of the SBSP Restoration Project: one at the levee between Ponds R4 and R5 and one between Pond S5 and Flood Slough. These two structures are identical to those described for Alternative Ravenswood C. The inclusion of the City of Redwood City's Bayfront Canal and Atherton Channel Project (often referred to as the Bayfront Canal Project, the draft project description for which is included as Appendix I) would create a more complex connection between Flood Slough and Pond S5's small, triangular forebay. This action is discussed below.

  The water control structures would be gated at the inlet and/or outlet. The design calls for a prefabricated concrete box culvert to reduce corrosion concerns typically expected in brackish water. Alternatively, solid-wall HDPE pipes could be employed because they provide a longer service life (greater than 50 years). The number, size, and invert elevations of water control structures that would be installed at proposed locations around the project site, depending on the types that are chosen, are listed in Table 2-6.

  Together, all of these activities would allow for the creation of managed pond habitat for diving and dabbling ducks and other birds with pond bottom depths maintained at subtidal elevations by enabling year-round control of water levels and some control of the salinities of the ponds.

- Incorporate Redwood City's Bayfront Canal and Atherton Channel Project. In this component, a combination of culverts and open channels would be installed to direct peak stormwater runoff from the Bayfront Canal into the triangular forebay of Pond S5 and into Ponds S5 and R5 beyond that. Open channel improvements would be made upstream and downstream of the proposed culvert installation to enhance flow to and from the culvert. The water control structures described above would allow the freshwater outflow from the culvert to move between ponds, and ultimately to the Bay, and also to manage water quality in the ponds during the dry season. Details for the Bayfront Canal and Atherton Channel Project improvements are shown on Figure 2-19.

Additionally, peak stormwater runoff from occasional large storms would be allowed to be temporarily diverted from the Bayfront Canal and Atherton Channel into Ponds S5 and R5 to help reduce existing salinity conditions in Ponds R5 and S5. This connection would also reduce the risk of heavy runoff from the Bayfront Canal backing up and causing flooding when high tides in Flood Slough prevent it from draining quickly. Water would also be controlled to flow from Ponds R5 or S5 into Ponds R4 or R3as needed for flood control or other management purposes.

The Bayfront Canal Project would include the components described below.

1. <u>Open channel improvements</u>. Open channel improvements would be conducted on the existing vegetated channels both immediately upstream and downstream of the proposed culvert.

2. <u>Excavation</u>. The culverts associated with the Bayfront Canal Project would pass under the Bedwell Bayfront Park entrance road.

3. <u>Culvert installation</u>. A culvert consisting of four 63-inch-diameter HDPE pipes would connect the upstream open channel to the downstream open channel, ultimately connecting to the Pond S5 forebay. A trash rack and operational sluice gates would be incorporated into the inlet headwall structure for the culvert and the outlet headwall structure. The culvert would be fitted with flap-gates.

4. <u>Caltrans stormwater pipe installation</u>. The proposed culvert would cross underneath an existing Caltrans double 48-inch-diameter stormwater pipes, necessitating temporary removal and reinstallation after the culvert is in place.

Construction Methods

Construction of Common Elements

Site Clearance and Demolition of Existing Water Control Structures. Prior to performing construction activities, areas to be disturbed would be cleared of any existing vegetation and disposed off-site. An existing water control structure at Pond R5 consists of a 72-inch-diameter corrugated metal pipe through the levee between Ponds R4 and R5. During construction, this culvert and all associated support structures would be demolished and disposed off-site or recycled as appropriate.

AAC Levee Improvements. Levee improvements at the AAC would consist of preparing the subgrade to receive additional fill material by clearing vegetation, debris, and grooving. Fill would be placed in 8-inch-thick lifts and compacted either through a vibratory hand tamper or a roller to achieve 95 percent compaction. Borrow material would be sourced on-site from levee lowering at Pond R4, internal levee removal at Ponds R5 and S5, pilot channel excavation, and off-site upland re-use materials. Levee lowering at Pond R4 would remain at elevations above the MHHW until construction activities within the pond that need to be performed in dry conditions are complete.

Levee Breaches. From the preliminary design, it is estimated that tidal volumes of 345 acre-feet would be required to exchange per day with the ponds. To accomplish this tidal exchange, several breaches of varying sizes are proposed. Breaching would be accomplished from levee crest using long-reach excavators and hauling material to on-site locations receiving fill for levee improvement or habitat transition zones.

Levee Removal. An excavator would be used to remove all or part of the levees within and between Ponds R5 and S5. Removed material would be used to fill borrow ditches in Pond R4 or to construct habitat transition zones.

Water Control Structures. The design calls for a concrete box culvert to reduce the corrosion concerns typically expected in brackish water. Alternatively, solid-wall HDPE pipes would also be suitable because they provide a longer service life (greater than 50 years).

Habitat Transition Zones. Habitat transition zones would be constructed by placing fill material along the slopes and compacting to 70–80 percent density to enable vegetation establishment. Slope protection would be maintained by establishment of native vegetation. Hydroseeding or other seeding method with a native plant mix, development of a planting scheme, and invasive plant control would aid in establishing desirable vegetative habitat.

Dewatering. Construction could occur in the wet or the dry. If the contractor decides to perform construction in the dry, some localized dewatering would be required. Dewatering of pond bottom would be accomplished by evaporating the pond beds to provide access to excavate pilot channels. Limited, local dewatering using portable, generator-powered pumps would likely take place during the installation of water control structures. Pumped water would be discharged downstream of the construction area.

Construction Access. As shown on Figure 2-20, the Ravenswood Ponds would be primarily accessed from the Marsh Road exit on U.S. 101 via the entrance to the City of Menlo Park's Bedwell Bayfront Park. The USFWS has an access easement with the city for this purpose. Alternate access to the southern edge of Pond R3 is possible from the paved bicycle path/hiking trail just north of SR 84.

The construction areas in and around the ponds themselves would be accessed via existing trails in Bedwell Bayfront Park and on the Refuge levee crests. The USFWS Refuge staff drive on the levees for maintenance, cleanup, and other management purposes, and it is assumed that the existing levees are capable of handling heavy construction equipment. Ponds R4, R5, and S5 can be accessed via existing trails on the edge of Bayfront Park and the outboard perimeter levee in Ponds R3 and R4. The crests of the berms on either side of the AAC or the levee around the perimeter of Pond R4 would be used to access various construction areas in Ponds R3 and R4.

If conditions warrant, levee improvements, including the widening of the crest to provide adequate pathway for construction equipment, would be undertaken. Heavy vehicles would avoid crossing structures in the levees if the vehicle exceeds the weight-bearing capacity of a structure. If this is not possible, engineer-approved precautions would be taken to avoid damaging the structure.

Construction Staging Areas. Staging areas would be established for equipment and material storage for each of the Action Alternatives. Some agreements with the City of Menlo Park may need to be made to arrange for staging areas within Bedwell Bayfront Park. Three possible locations for staging purposes are as follows:

- Vacant space at the corner intersection of Marsh Road and Bayfront Expressway near the site entrance from Marsh Road;
- The parking area along Marsh Road that borders Bedwell Bayfront Park; and
- The internal trails and lightly vegetated areas within Bedwell Bayfront Park that border Ponds R4 and R5 (would be widened as needed to establish a temporary staging area).

Equipment. Excavators, bulldozers, amphibious equipment (e.g., an aquatic excavator), dump trucks, compaction rollers or vibratory plates, a water tanker, pumps, sheet piles, refueling tanks, and pickup vehicles for transportation in and out of the project site would be used during construction. Depending on the soil conditions within the ponds, temporary heavy equipment mats or wooden mats with gravel cover would be employed to provide access and establish working conditions to excavate pilot channels at the pond bottom. Temporary fill would also be used at staging locations if required. Upland fill material would be transported to the project area by trucks.

Construction Timing Considerations. There are certain special-status species that may be affected by construction activities. The presence of these species may limit construction activities or require certain avoidance and minimization measures. The specific limits and requirements for each species and their habitats will be addressed during the permitting phase of the project. However, the timing considerations below will be incorporated into detailed designs and project planning to reduce the overall potential for adverse impacts and the need for mitigation.

- Bird nesting: Regulatory work windows for bird nesting typically run from February 1 through September 15. Work could likely occur within this window in the presence of a biological monitor and preconstruction surveys.
- Longfin smelt and green sturgeon: These species could be present year-round. In-channel work may require that a USFWS-approved biological monitor be present.

If construction is to occur entirely outside of the species windows, or if fill material is not all available at once, completion of construction activities would likely extend into a second construction season.

Construction of Alternative Ravenswood B

The following components of Alternative Ravenswood B are not common to all Action Alternatives, though many of them are included in one of the other Action Alternatives.

Pilot Channel Excavation. Existing soil conditions at the pond bottom are likely to be too soft to support vehicles or heavy equipment. Temporary mats with gravel cover would be deployed at the pond bottom to create a firm surface that can handle heavy equipment such as an excavator, loader, or mini-dozer to access locations where pilot channels are to be established. Alternatively, amphibious equipment such as an aquatic excavator would be used to excavate in the wet to designed depths. It is likely that removed material would be unsuitable to be used as levee fill material and would instead be used to fill borrow ditches within Pond R4 or as fill for habitat transition zones.

Levee Lowering or Removal. Levee lowering at the northwest corner of Pond R4 would be accomplished by using an excavator and loader and hauling the removed material to fill borrow ditches in Pond R4 or to construct habitat transition zones. Levee lowering at Pond R4 would remain at elevations above the MHHW until construction activities within the pond that need to be performed in the dry are complete. Portions of the internal levees between and within Ponds R5 and S5, with lengths ranging from 1,500 feet to 2,230 feet would be lowered to pond bottom elevation of 3.0 feet NAVD88. This activity would also use an excavator and loader. Removed material would be used to fill borrow ditches in Pond R4 or to construct habitat transition zones.

Habitat Island. The expected treatment for the top surface of the island is a 12-inch-thick sand layer underlain by a 6-inch-thick crushed rock to minimize weed establishment. The sand layer would be mixed with bay mud to prevent formation of cracks. The sand layer would be covered with 4-inch-thick layer of oyster shells, if available, to provide a barren land site that is typically preferred by nesting birds. Other combinations of rock, sand, dirt, or other materials may be used as available. These materials would be brought in and placed prior to removal of the portions of the levee to be breached.

Construction Sequence. Earthwork activities would be sequenced such that activities that would be efficient to perform in dry conditions would be completed first. These activities would include levee improvements, hydraulic controls, pilot channel excavation, and internal levee lowering. Levee lowering and breaching along the outer bounds of the ponds that are designed to establish hydraulic connection with adjacent sloughs would be performed after the internal pond activities are completed.

From this concept, the likely order of construction for Alternative Ravenswood B would be as follows, though availability of upland material for various actions could alter the sequence:

1. Clear site and demolish existing water control structure.
2. Modify central portion of levee between Ponds R5 and S5 with gravel, sand, and shells in preparation for its use as a habitat island.
3. Remove internal levees between Ponds R5 and S5 and within Pond S5, as described above.
4. Improve levee along the All-American Canal.
5. Excavate pilot channels in Pond R4.
6. Construct a habitat transition zone along the western edge of Pond R4 levee.
7. Install water control structures.
8. Lower Pond R4 levee near Greco Island.
9. Breach levee near eastern slough trace.
10. Install viewing platform.
11. Install fencing along southern border of pond cluster.

Once sufficient upland fill material to complete the initial construction plans for habitat transition zones and levee improvements is in place, additional material would be used as available to expand habitat transition zones or further raise or improve flood protection.

Construction Schedule. The construction schedule would be driven by the habitat windows, weather conditions, and volume of earthwork quantities to be moved. For Ravenswood Alternative B, there would be approximately 39,700 cubic yards of earth moving for the cut processes and 77,600 cubic yards for the fill processes. The 37,900 cubic yards of fill that cannot be generated from on-site cut activities would be imported from other construction sites.

Installation of a viewing platform would take approximately 2 weeks. These activities would not affect the construction schedule significantly compared to the earthwork. Although, it is assumed that the ponds would be sufficiently dry by the beginning of the construction season and that active draining or dewatering of pond bottoms would be unnecessary, limited installation of cofferdams and dewatering of small portions of the pond may be necessary for installing water control structures.

Construction is expected to begin in the summer or fall of 2017. Some of the construction activities could occur in tandem, with multiple crews to achieve project goals. A preliminary estimate shows that construction would be completed over approximately a 5-month period in a single construction season, assuming all upland material would be available. This estimate is also based on the assumption that some heavy construction activities would be permitted to occur during the nesting habitat window under the watch of a biological monitor.

Construction of Alternative Ravenswood C

The following components of Alternative Ravenswood C are not common to all Action Alternatives, though many of them are included in one of the other Action Alternatives.

Pilot Channel Excavation. The pilot channel would be excavated as described for Alternative Ravenswood B.

Levee Lowering or Removal. Levee lowering at the northwest corner of Pond R4 would be accomplished by using an excavator and loader and hauling the removed material to fill borrow ditches in Pond R4 or to construct habitat transition zones. Levee lowering at Pond R4 would remain at elevations above the MHHW until construction activities within the pond that need to be performed in the dry are complete. Portions of the internal levees between and within Ponds R5 and S5, with lengths ranging from 1,500 feet to 2,230 feet, would be lowered to pond bottom elevation of 3.0 feet NAVD88. This lowering would also use an excavator and loader. Removed material would be used to fill borrow ditches in Pond R4 or to construct habitat transition zones.

Ponds R5/S5 Bottom Fill for Alternative C. Fill from the excavation activities within Ponds R5 and S5—as well as from the Ponds R5/S5 levee and from the smaller levee between Pond S5 and its triangular forebay—would be used to raise the pond bottoms in Ponds R5 and S5 to tidal mud flat elevation. Bulldozers and graders would be used to spread the material as required.

Habitat Island. The expected treatment for the top surface of the island is a 12-inch-thick sand layer underlain by a 6-inch-thick crushed rock to minimize weed establishment. The sand layer would be mixed with bay mud to prevent formation of cracks. The sand layer would be covered with 4-inch-thick layer of oyster shells, if available, to provide a barren land site that is typically preferred by nesting birds. Other combinations of rock, sand, dirt, or other materials may be used as available. These materials would be brought in and placed prior to removal of the portions of the levee to be breached.

Trail Construction. The trail would be at least 6 feet wide and would be built on improved or existing levees. Erosion or uneven surfaces on existing levees would be regraded for compliance with the ABA on federal lands and the ADA elsewhere. Levees would be graded and compacted. Geotextile fabric would be laid out and gravel imported and compacted in place. Quarry fines would then be compacted over the gravel with a smooth drum compactor to create an accessible surface.

Construction Sequence. Earthwork activities would be sequenced such that activities that would be efficient to perform in the dry would be completed first. In Alternative Ravenswood C, these activities would include levee improvements, hydraulic controls, pilot channel excavation, and internal levee lowering. Levee lowering and breaching along the outer bounds of the ponds that are designed to establish hydraulic connection with adjacent sloughs would be performed after the internal activities are completed.

From this concept, the order of construction within the Ravenswood complex would be as follows, though availability of upland material for various actions could alter the sequence:

1. Clear site and demolish existing water control structure.
2. Modify central portion of levee between Ponds R5 and S5 with gravel, sand, and shells in preparation for its use as a habitat island.
3. Remove all or part of internal levees between Ponds R5 and S5 and within Pond S5.
4. Fill and grade Ponds R5 and S5 bottoms.
5. Improve levee along the All-American Canal.
6. Excavate pilot channels in Pond R4.
7. Construct habitat transition zones along the western edge of Pond R4 levee and along the All-American Canal levee.
8. Install water control structures.
9. Lower Pond R4 levee near Greco Island.
10. Construct boardwalk trail.
11. Construct trail on Ponds R4/R5, Ponds R3/R5, and Ponds R3/S5 levees.
12. Breach levee near eastern slough trace, northwest border of Pond R4.
13. Install viewing platforms.
14. Install fencing along southern border of pond cluster.

Once sufficient upland fill material to complete initial construction plans for habitat transition zones and levee improvements is in place, additional material would be accepted as available to expand the habitat transition zones or further raise or improve flood protection.

Construction Schedule. Construction schedule would be driven by the habitat windows, weather conditions, and volume of earthwork quantities to be moved. Approximately 45,400 cubic yards of earth moving for the cut processes and 255,800 cubic yards for the fill processes would be required. The 210,400 cubic yards of fill that cannot be generated from on-site cut activities would be imported from other construction sites.

Installation of most walkway and viewing platforms is estimated to take no more than 2 weeks. The elevated boardwalk trail would take several weeks to construct.

Construction is expected to begin in the summer or fall of 2017. Some of these construction activities could occur in tandem with multiple crews to achieve project goals. Construction would be completed in one 7-month-long construction season, assuming all upland material would be available for construction. This estimate is also based on the assumption that some heavy construction activities would be permitted to occur during the nesting habitat window under the watch of a biological monitor.

Construction of Alternative Ravenswood D

The methods of construction of most of the individual components of Alternative Ravenswood D were discussed in either the common components section or in Alternatives Ravenswood B or C. The exceptions are described below.

Levee Lowering or Removal. All of the internal levees between and within Ponds R5 and S5 and the pond bottoms themselves would be lowered to pond bottom elevation of 3.0 feet NAVD88. This lowering would require the use of an excavator and loader. Removed material would be used to fill borrow ditches in Pond R4 or to construct habitat transition zones. Unlike Alternatives Ravenswood B and C, the northwest levee of Pond R4 would not be modified.

Trail Construction. Two trails would be constructed as part of Alternative Ravenswood D. The trail on northwest levee of Pond R4 would be approximately 1,200 feet long along the northwest levee of Pond R4. The trail on eastern edge of Ponds R5 and S5 would be approximately 2,700 feet long along the eastern levee of Ponds R5/S5 adjacent to Ponds R3 and R4.

The trails would be at least 6 feet wide and would be built on improved or existing levees. Erosion or uneven surfaces on existing levees would be regraded for compliance with the ABA on federal lands and the ADA elsewhere. Levees would be graded and compacted. Geotextile fabric would be laid out and gravel would be imported and compacted in place. Quarry fines would then be compacted over the gravel with a smooth drum compactor to create an accessible surface.

Bayfront Canal and Atherton Channel Project. A combination of culverts and open channels would be installed to direct peak stormwater runoff from the Bayfront Canal into the triangular forebay of Pond S5 and Ponds R5 and S5 beyond that. Open channel improvements would be made upstream and downstream of the proposed culvert installation to enhance flow to and from the culvert. The proposed alignment for the culverts crosses beneath existing Caltrans stormwater pipes; therefore, the Caltrans pipes would be temporarily removed during the culvert installation and replaced afterward.

The Bayfront Canal and Atherton Channel Project would include construction of the components described below.

1. <u>Open channel improvements</u>. Open channel improvements would be conducted on the existing vegetated channels both immediately upstream and downstream of the proposed culvert. Approximately 2,200 cubic yards of material would be removed, and grading to a 2:1 (h:v) side-slope and 1.5:1 (h:v) side-slope, respectively would take place. The upstream inlet of the open channel at the Bayfront Canal would be stabilized. Approximately 700 square feet of articulating concrete block mat or rock riprap would be placed at a 2:1 (h:v) slope at the channel inlet.

2. Excavation. The culverts associated with the Bayfront Canal and Atherton Channel Project would pass under the Bedwell Bayfront Park entrance road. This location would require excavation of a strip of road and the ground under it for culvert placement and temporary removal of the existing Caltrans stormwater pipes. This excavating would also affect the phasing of the construction of this structure because it is assumed that only a portion of the roadway width would be closed at any given time. The culvert would likely need to be installed along one portion of its length and then the remainder, leaving one lane of the entrance road open at all times. After construction is completed, the ground and roadway would be replaced and resurfaced to return the roadway to its pre-project condition.

3. Culvert installation. A culvert consisting of four 63-inch-diameter HDPE pipes would connect the upstream open channel to the downstream open channel and ultimately connect with the Pond S5 forebay. A trash rack and operational sluice gates would be incorporated into the inlet headwall structure for the culvert and the outlet headwall structure. The culvert would be fitted with flap-gates. Approximately 6,800 cubic yards of material would be excavated for the pipe installation. A cast-in-place concrete headwall would be constructed for the inlet and outlet structures. Approximately 120 cubic yards of 1.5-foot-thick rock, covering approximately 2,100 square feet, would be placed at the outlet of the culvert to prevent erosion in the open channel. Marsh Road would be re-paved and vegetation re-planted at the completion of the project. To enhance outflow from the culvert, the Pond S5 forebay would also be excavated and material placed into the All-American Canal levee or one of the habitat transition zones, similar to the material removed from the upstream open channel. Approximately 4.3 acres would be excavated (about 24,600 cubic yards of material).

4. Caltrans stormwater pipe installation. The proposed culvert would cross underneath existing Caltrans double 48-inch-diameter stormwater pipes. To install the culvert, approximately 70 linear feet of the Caltrans reinforced concrete pipe (RCP) would be removed during the dry season for construction and replaced on completion.

Construction Sequence. Earthwork activities would be sequenced such that activities that would be efficient to perform in the dry would be completed first. This sequence would include levee improvements, hydraulic controls, and internal levee lowering. Levee breaching at Pond R4 along the outer bounds of the ponds that are designed to establish hydraulic connection with the adjacent slough would be performed after the internal activities are completed.

From this concept, the likely order of construction within the Ravenswood complex would be as follows, though availability of upland material for various actions could alter the sequence:

1. Clear the site and demolish the existing water control structure.

2. Remove the internal levees between Ponds R5 and S5 and within Pond S5.

3. Improve levee along the All-American Canal.

4. Construct habitat transition zones along the All-American Canal levee, the northwestern levee of Pond R4 near Greco Island, and the southern edge of Pond R3.

5. Construct Redwood City's Bayfront Canal and Atherton Channel Project.

6. Install water control structures and finalize connections with Redwood City's stormwater connection.
7. Breach Pond R4 levee near the eastern slough trace.
8. Construct a trail on the Pond R4 levee near Greco Island and a trail on the Ponds R4/R5, Ponds R3/R5, and Ponds R3/S5 levees.
9. Install viewing platforms.
10. Install fencing along the southern border of the pond cluster.

Once sufficient upland fill material to complete initial construction plans for habitat transition zones and levee improvements is in place, additional material would be accepted as available to expand habitat transition zones or further raise or improve flood protection.

Construction Schedule. The construction schedule would be affected by the habitat windows, weather conditions, and the volume of earthwork quantities to be moved. For Ravenswood Alternative D, the SBSP Restoration Project designs indicate that there would be approximately 56,700 cubic yards of earth moving for the cut processes and 73,000 cubic yards for the fill processes. In addition to these volumes, in Alternative Ravenswood D, excavation planned for Redwood City's Bayfront Canal and Atherton Channel Project would generate an additional surplus of 31,200 cubic yards of earth that would be used for levee raising or habitat transition zone construction. These amounts lead to an overall surplus of 14,900 cubic yards. No net import of material from off-site projects would be necessary under Alternative Ravenswood D.

Installation of most walkway and viewing platform is estimated to take approximately 2 weeks. These activities would not affect the construction schedule significantly compared to the earthwork. It is assumed that the ponds would be dry by the beginning of the construction season and that active draining or dewatering of ponds would be unnecessary. However, limited installation of cofferdams and dewatering of small portions of the pond may be necessary for installing water control structures.

Construction is expected to begin in the summer or fall of 2017. One likely construction sequence scenario is as described in "Construction Sequence," above. Some of these construction activities could occur in tandem with multiple crews to achieve project goals. A preliminary estimate shows that construction could be completed in 15 months spanning two construction seasons, assuming all upland material would be available to be accepted and placed in those seasons This estimate is also based on the assumption that some heavy construction activities would be permitted to occur during the nesting habitat window under the watch of a biological monitor. During construction of the inlet headwall for the Bayfront Canal culvert and during channel excavation, public vehicle access to the Bedwell Bayfront Park would be maintained. After completion of the inlet headwall, excavation would continue eastward and public vehicle access to the park would be prohibited. Public foot traffic would be allowed around the fenced construction site to Bedwell Bayfront Park until excavation of the culvert outlet begins, at which point public access would be prohibited until the completion of the project (approximately 1.5 months). The contractor would provide traffic safety control throughout the duration of the project. Removal of the Caltrans stormwater pipe would occur during the summer months to avoid stormwater flow; otherwise a temporary bypass would be constructed.

Operations and Maintenance: All Action Alternatives

Operations and maintenance activities for the components of the pond clusters within the Refuge would continue to follow and be dictated by 2009 USACE permit #2008-00103S, applicable County operations, and the AMP. The City of Menlo Park would continue to operate and maintain its properties that are adjacent to the pond cluster, in coordination with the Refuge managers. In Alternative Ravenswood D, the City of Redwood City would also coordinate its management and maintenance of the Bayfront Canal and Atherton Channel water diversion system with other O&M activities, as described below.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require a staff person to travel to the pond cluster one or two times a week to perform activities such as water structure control operation, invasive plant control, and vandalism repairs. In addition, AMP monitoring activities would occur, which would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond clusters to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird-breeding season, there would be more trips to the site than during the non-breeding season).

Ongoing levee maintenance would continue for existing levees that provide flood protection (as part of the O&M activities described above and in consistency with USACE permit #2008-00103S). Levee maintenance activities would include the placement of additional earth on top of or on the pond side of the levees as the levees subside, with the level of settlement dependent on geotechnical considerations. In general, pond levees that are improved to provide flood protection would likely exhibit the greatest degree of settlement. Levees that require erosion control measures would also require routine inspections and maintenance. The northern perimeter levee at Pond R4 would not be maintained and would be allowed to degrade naturally.

Improved levees would be inspected and maintained for slope stability, erosion control, seepage, slides and settlement on an annual basis. Maintenance is expected every 5 years to add additional fill material in areas where settlement occurs. Most of the maintenance work can be accomplished during low tides and from the levee crests. If the levees that provide flood protection are improved to provide FEMA 100-year flood protection, a detailed levee maintenance plan would be required for certification to comply with FEMA standards.

Water control structures would require inspection for structural integrity of gates, pipes, and approach way; obstruction to flow passage and preventative maintenance such as visual functionality of gates, seals; and removal of debris. In Alternative Ravenswood D only, these same activities would be required for the Redwood City stormwater connection. Inspection would be required every month until the first year and semi-annually thereafter. Maintenance would be required on an annual basis. O&M would be accomplished during low tides in Pond R4 and sloughs and by maintaining low storage conditions in the managed ponds.

Maintenance of habitat transition zones would include inspections and maintenance for slope stability, erosion control, seepage, slides, and settlement on an annual basis. As necessary, vegetation removal would occur to prevent colonization of invasive species. Fill material would be placed, when needed, to respond to areas where erosion has been observed. Maintenance activities would also be dictated by the AMP if an AMP management trigger is reached, especially a trigger related to a biological resource (e.g., salt marsh harvest mouse) that would utilize habitat transition zone as habitat.

Maintenance of public access and recreation features is similar but not identical across the Action Alternatives. The viewing platforms would be designed to minimize maintenance utilizing durable and sustainable materials as much as possible to prevent degradation and the need for repeated maintenance. All features would need to be checked periodically for defacement of interpretive boards and other forms of vandalism. Alternatives Ravenswood C and D would also include occasional trail maintenance to keep them safe and accessible. There would be a need for trash removal along trails and more intensively at staging areas and trailheads.

Operations and maintenance of water levels in Ponds R3, R5, and S5 would differ across the three Action Alternatives, as described below.

<u>Alternative Ravenswood B:</u>

- The water levels in Ponds R5 and S5 would be actively managed year-round by opening and closing the water control structures as needed to maintain desired surface elevations, flows, and water quality. The salinity of these ponds would also be somewhat controlled through the use of the water control structures. USFWS Refuge staff would operate the water control structures and provide maintenance and cleaning as needed.
- The water levels of Pond R3 would be actively managed using one new water control structure to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate all of the water control structures and provide maintenance and cleaning as needed.

<u>Alternative Ravenswood C:</u>

- The water levels in Ponds R5 and S5 would be actively managed year-round by opening and closing the water control structures as needed to maintain desired surface elevations, flows, and water quality. Water surface elevation in Ponds R5 and S5 would be managed to receive regular damped or muted tidal flows and maintain the pond bottoms at an intertidal elevation to form mudflats for shorebirds. The salinity of these ponds would also be somewhat controlled through the use of the water control structures. In addition, water would be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or other management purposes.
- The water levels of Pond R3 would be actively managed using two new water control structures to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate all of the water control structures and provide maintenance and cleaning as needed.

<u>Alternative Ravenswood D:</u>

- The water levels in Ponds R5 and S5 would be actively managed year-round using the water control structures that would be installed as a part of meeting the habitat restoration goals of these ponds. Water surface elevation in Ponds R5 and S5 would be managed to create open water habitat for diving and dabbling ducks and other birds. Water levels would be maintained such that bottom depths are at subtidal elevations except during storm events. Prior to and during storm events when the tide in Flood Slough is high, the ponds would be drawn down to provide capacity for temporary detention of stormwater runoff from the City of Redwood City. Stormwater would enter into Pond S5 through new water control structures that would be installed to connect the Redwood City storm drain outflow to the forebay of Pond S5. This stormwater would then be discharged back into Flood Slough through a new water control structure between the pond and the slough when the tide is low and the slough can accept that volume of stormwater. The salinity of Ponds R5 and S5 would also be somewhat controlled through the use of the water control structures by receiving low salinity stormwater. Additionally, water would also be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or for salinity dilution or other management purposes.

- The water levels of Pond R3 would be actively managed using two new water control structures to provide for the improvement of the existing western snowy plover habitat in Pond R3. USFWS Refuge staff would operate the water control structures for habitat and water quality management purposes and provide maintenance and cleaning as needed.

2.3 General Mitigation Measures from the 2007 EIS/R

In developing the 2007 EIS/R for the SBSP Restoration Project, the USFWS and CDFW developed program-wide comprehensive mitigation measures that could be expanded into actions when designing the project-level phases to implement the SBSP Restoration Project or direct the environmental analyses for the future phases. The intent of these mitigation measures was to avoid or reduce the environmental effects of any project alternative through the project design or focus the impact analysis on key impact issues recognized in the 2007 EIS/R. When mitigation measures are developed in program-level NEPA and CEQA documents and adopted by the lead agencies and other project partners, the expectation is that those measures will be included as part of the project-level designs whenever it is feasible to do so. With very few exceptions, this project-level EIS/R has followed this practice and will implement those measures as standard parts of the project designs; therefore, these measures need not be repeated in each of the alternative described above.

The notable exception of a program-level mitigation measure that is not feasible to implement is Mitigation Measure 3.12-1: Timing of construction-related truck trips. That measure is discussed at length below.

This section presents the mitigation measures from the 2007 EIS/R that are common to and relevant to the Phase 2 alternatives included in this project-level EIS/R. These measures would be incorporated into the project design of all action/project alternatives; they are thus part of the Phase 2 projects and not actually “mitigation measures.” For this reason, they are included in this chapter. These measures have been edited for relevancy with Phase 2 actions.

2.3.1 Surface Water, Sediment and Groundwater Quality

SBSP Mitigation Measure 3.4-5c: Actions to Minimize Illegal Discharge and Dumping

The SBSP Restoration Project will undertake the following activities to ensure that existing programs and practices avoid impacts due to illegal discharge and dumping:

- Gate structures upstream of the SBSP Restoration Project area will include a trash capture device that will prevent fouling of marsh and pond complexes.

- Plans for recreational access in the SBSP Restoration Project area will include appropriate trash collection receptacles and a plan for ensuring regular collection and servicing.
- “No Littering” signs will be posted in public access areas.

SBSP Mitigation Measure 3.4-5d: Monitoring Sediments to Follow Existing Guidance and Comply with Emerging Regulations

Sediment monitoring data will be used to determine appropriate disposal or beneficial re-use practices for sediments. If sediment monitoring data indicate that tidal scour outside a levee breach could remobilize sediments that are significantly more contaminated than Bay ambient conditions, the SBSP Restoration Project will consult with the appropriate regulatory agencies regarding other potentially required actions.

SBSP Mitigation Measure 3.4-5e: Urban Runoff Management

The project proponents will notify the appropriate Urban Runoff Program of any physical changes (such as breaches) that will introduce urban discharges into the project area, and request that the Urban Runoff Program consider those changes when developing annual monitoring plans.

SBSP Mitigation Measure 3.4-6: USFWS and the Conservancy (Project Proponents) Will Coordinate with SCVWD to Ensure That the Following Activities Take Place

If any abandoned wells are found before or during construction they will be properly destroyed by the project as per local and state regulations by coordinating such activities with the local water district. If abandoned wells are located during restoration or other future activities within SCVWD boundaries, a well destruction work plan will be prepared in consultation with SCVWD (as appropriate) to ensure conformance to SCVWD specifications. The work plan will include consulting the databases of well locations already provided by SCVWD. The project will properly destroy both improperly abandoned wells and existing wells within the project area that are subject to inundation by breaching levees. Well destruction methods will meet local, county, and state regulations. The project proponents will also lend support and cooperation with any well identification and destruction program that may be undertaken as part of the Shoreline Study or other projects.

2.3.2 Cultural Resources

SBSP Mitigation Measure 3.8-1: Discovery of Unknown Resources

Background

Restoration actions planned for the SBSP Restoration Project area shall be treated as individual archaeological projects. The overall record search for this EIS/R was performed in June 2006. A new record search shall be performed for any projects within the SBSP Restoration Project area where the previous record search is more than 5 years old.

Site Survey

Prior to the beginning of any project construction activity that could affect the previously un-surveyed portions of the project area, qualified professional archaeologists shall be retained to inventory all portions of the restoration site that have not been examined previously or have not been examined within the last 15 years. The survey(s) shall be conducted during a time when the ground surfaces of potential project sites are visible so the natural ground surface can be examined for traces of prehistoric and/or historic-era cultural resources. If the survey(s) reveals the presence of cultural resources on the project site (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, and structure/building remains), and those resources have not been dealt with sufficiently in any Cultural Landscape documentation, the resources shall be documented according to current professional standards. The resources shall be evaluated for potential eligibility to the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR). Depending on the evaluation, additional mitigation measures may be required, including avoidance of the resource through changes in construction methods or project design or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements.

Pre-Construction Contractor Education

Prior to any project-related construction, a professional archaeologist shall be retained to address machinery operators and their supervisors, preferably by giving an on-site talk to the people who will perform the actual earth-moving activities. This will alert the operators to the potential for finding historic or prehistoric cultural resources.

Construction Monitoring

Any project-related construction that occurs within 100 feet (30 meters) of a known prehistoric resource shall be monitored by a qualified professional archaeologist and a Native American monitor. If elements of the known resource or previously unknown cultural resources are encountered during project construction, all ground-disturbing activities shall halt within a 100-foot radius of the find. The archaeologist shall identify the materials, determine their possible significance, and formulate appropriate measures for their treatment in consultation with the Native American monitor, Most Likely Descendant (MLD), or appropriate Native American representative and the appropriate Lead Agency. Potential treatment methods for significant and potentially significant resources may include, but would not be limited to, no action (i.e., resources determined not to be significant), avoidance of the resource through changes in construction methods or project design, or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. These measures shall be implemented prior to resumption of project construction.

Unanticipated Finds

If contractors identify possible cultural resources, such as unusual amounts of bone, stone, or shell, they shall be instructed to halt operation in the vicinity of the find and follow the appropriate contact procedures. Work shall not resume in the vicinity of the find until a qualified professional archaeologist has had the opportunity to examine the finds. The archaeologist shall identify the materials, determine their possible significance, if the finds are prehistoric, formulate appropriate measures for their treatment in consultation with the Native American monitor, MLD, or appropriate Native American representative and the appropriate Lead Agency. Potential treatment methods for significant and potentially significant resources may include, but would not be limited to, no action (i.e., resources determined not to be significant), avoidance of the resource through changes in construction methods or project design, or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. These measures shall be implemented prior to resumption of project construction.

Human Remains

California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code Section 7050.5 and Section 7052 and California Public Resources Code Section 5097. The California Health and Safety Code require that if human remains are found in any location other than a dedicated cemetery, work is to be halted in the immediate area.

The appropriate agency or the agency's designated representative shall be notified. The agency shall immediately notify the county coroner and a qualified professional archaeologist. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American interment, then coroner shall contact the Native American Heritage Commission within 24 hours.

The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods, as provided in Public Resources Code Section 5097.98. The landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if: (1) the Native American Heritage Commission is unable to identify an MLD or (2) the MLD fails to make a recommendation within 24 hours after being notified by the commission or (3) if the landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

SBSP Mitigation Measure 3.8-2: Cultural Landscape, Inventory of Resources, Treatment of Finds

In June 2012 the USFWS and California State Historic Preservation Officer (SHPO) signed a Memorandum of Agreement (FWS0407121A) that established a set of stipulations and a treatment plan that would allow the USFWS to carry out the project while satisfying the requirements of Sections 106 and 110(b) of the National Historic Preservation Act (NHPA). On consultation with the SHPO, the USFWS developed a historic properties treatment plan that will be implemented prior to and during the project. This historic properties treatment plan and the mitigation measures established within this treatment plan are hereby incorporated by reference. Appendix F of the 2007 EIS/R contains a copy of the Memorandum of Agreement (MOA) and historic properties treatment plan.

2.3.3 Traffic

SBSP Mitigation Measure 3.12-1: Timing of Construction-Related Truck Trips

This mitigation measure required the landowner (USFWS) to include in construction plans and specifications the requirement that construction-related truck trips, specifically deliveries of fill and equipment, shall occur outside the weekday am and pm peak commute traffic hours. This mitigation measure is not feasible to implement in the Phase 2 actions because of the large amount of upland material that needs to be imported by truck to three of the pond clusters in relatively condensed periods of time.

Finding source projects with sufficient quantities of upland fill material is difficult for several reasons. The excavation must occur in a year and season when the SBSP Restoration Project can accept it. Stockpiling material or moving it more than once is prohibitive and would increase environmental impacts. Then, to be used in a restoration project, the material must pass a screening to demonstrate its lack of contamination. The source project should also be located close enough to the restoration project that bringing it there would both have fewer environmental impacts and be less expensive than bringing to a landfill or other destination. Successfully meeting all of those criteria is likely to limit the number of suitable source projects. It would not, then, be feasible to further constrain the source project and dirt broker/haulers by limiting the hours of material delivery to the non-peak commute periods. Assuming these entities would be willing to comply, their own costs would increase, and they would pass that on to the SBSP Restoration Project, raising associated costs by an estimated 30 percent at a minimum.

Collectively, these barriers make the implementation of the restricted hours from MM 3.12-1 infeasible. However, importantly, the nearest likely disposal site for upland fill material generated at projects in San Mateo County and Santa Clara County is at a former quarry in Fremont, just north of the eastern landing of the Dumbarton Bridge. This location means that, in the absence of the SBSP Restoration Project, the likely haul route for transporting the material would go past one or more of the Phase 2 pond clusters. The traffic, air quality, and noise impacts are expected to be equal to or worse than the impacts if the material cannot be used at the Phase 2 project locations and has to go to the default disposal site.

For these reasons, the SBSP Restoration Project will not uniformly be implementing this mitigation measure and instead conducted a full analysis of the number of truck trips and the impacts associated with them. These are presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

SBSP Mitigation Measure 3.12-3: Parking at Recreational Facilities

The landowner (USFWS), in coordination with the cities with jurisdiction over the proposed recreation improvements (where applicable), shall design recreational facilities with sufficient parking spaces to accommodate the projected increase in vehicles that access the site, unless adequate off-site parking is available to meet the demand for parking spaces.

SBSP Mitigation Measure 3.12-4: Video Record of Road Conditions

If residential streets are part of the designated haul route for any future phases of the SBSP Restoration Project, the landowners shall prepare a video record of road conditions prior to the start-up of construction for the residential streets affected by the project. The landowner (USFWS) shall prepare a similar video of road conditions after project construction is completed. The pre- and post-construction conditions of haul routes shall be reviewed by staff of the local Public Works Department. An agreement shall be entered into prior to construction that will detail the pre-construction conditions and post-construction requirements of the roadway rehabilitation program.

2.3.4 Noise

SBSP Mitigation Measure 3.13-1: Short-Term Noise Effects

The landowners shall include in construction plans and specifications the following requirement:

- All construction activities shall be limited to the days and hours or noise levels designated for each jurisdiction where work activities occur, as specified below:

Alviso

- City of San Jose: Construction activities shall not exceed 55 A-weighted decibels (dBA) at residential-zoned districts except upon issuance of and in compliance with a Conditional Use Permit.
- City of Fremont: There are no restrictions for temporary construction activities.
- City of Sunnyvale: Construction activities shall occur between 7 am and 6 pm Monday through Friday and 8 am to 5 pm on Saturday. Construction activities shall not occur during Sunday or national holidays.
- Santa Clara County: Construction activities shall occur during the daytime hours of 7 am to 7 pm Monday through Saturday, except legal holidays.
- City of Mountain View: construction activities shall occur between 7 am and 6 pm Monday through Friday. Construction activities shall not occur during Saturdays, Sundays, or holidays unless prior written approval is granted by the building official.

Ravenswood

- Locate all construction equipment staging areas at the furthest distance possible from nearby noise-sensitive land uses.
- Construction equipment shall be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications.
- For City of Menlo Park only: Construction activities shall occur between 8 am and 6 pm Monday through Friday only.

SBSP Mitigation Measure 3.13-2: Traffic-Related Noise

The landowners shall include in construction plans and specifications the following requirements:

- Contractors shall use haul routes that minimizes traffic through residential areas.

SBSP Mitigation Measure 3.13-4: Operation of Portable Pumps

Where portable pumps would be operated in the vicinity of sensitive receptors such that noise levels would exceed noise standards established by affected jurisdictions, the landowners shall enclose the portable pump to ensure that a reduction of up to 10 decibels (dB) at 50 feet (15 meters) is achieved and the noise levels of affected jurisdictions are met.

2.3.5 Air Quality

The project design features would include a number of fugitive dust control measures, as discussed in the 2007 EIS/R for the SBSP Restoration Project. The control measures described in the 2007 EIS/R reflect the Bay Area Air Quality Management District (BAAQMD) Basic Control Measures, as outlined in the

BAAQMD 1999 CEQA Guidelines. BAAQMD has since revised this guidance and has updated this list of best management practices with additional control measures. Therefore, mitigation is required to meet the BAAQMD's updated Basic Construction Mitigation Measures Recommended for All Proposed Projects (BAAQMD 2010, 2011). Mitigation Measure 3.13-1 would require the implementation of these additional control measures.

Mitigation Measure 3.13-1: Basic Construction Mitigation Measures

The following Basic Construction Mitigation Measures shall be implemented for all construction sites within the project area:

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer‘s specifications. All equipment shall be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

These control measures, in addition to those included in the project design features, would meet BAAQMD Basic Construction Mitigation Measures Recommended for All Proposed Projects (BAAQMD 2010, 2011).

SBSP Mitigation Measure 3.14-1: Short-Term Construction-Generated Emissions

The following Basic Control Measures shall be implemented at all construction sites within the project area, regardless of size:

- Water all active construction areas at least twice daily, and more often during times of high wind.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet (0.6 meter) of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

The following Enhanced Measures shall be implemented at construction sites larger than 4 acres:

- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (e.g., dirt, sand).
- To the extent practicable, limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.
- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.

These additional “Optional Measures” shall be implemented if further emission reductions are necessary to meet a BAAQMD requirement or address other concerns:

- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
- Limit the area subject to excavation, grading and other construction activity at any one time.

SBSP Mitigation Measure 3.14-3a: TAC emissions

Toxic air contaminant (TAC) emissions from construction within 500 feet (152 meters) of sensitive receptors will require the following:

- Pursuant to BAAQMD Rule 6, the project shall ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately, and USFWS, CDFW, and BAAQMD shall be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the project, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. BAAQMD and/or other officials may conduct periodic site inspections to determine compliance.
- USFWS and the State Coastal Conservancy (SCC) shall provide a plan for approval by BAAQMD demonstrating that the heavy-duty (more than 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, would achieve a project-wide fleet average 45 percent particulate reduction compared to the most recent California Air Resources Board (CARB) fleet average. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels (e.g., Lubrizol, Puri NOx, biodiesel fuel) in all heavy-duty off-road equipment.
- USFWS and the SCC shall require in construction plans and specifications that the model year of all off-road construction moving equipment shall not be older than 1996.

- USFWS and the SCC shall require in construction plans and specifications a provision that prohibits contractors from operating pre-1996 heavy-duty diesel equipment on forecast Spare-the-Air Days or on days when air quality advisories are issued because of special circumstances (e.g., wildfires, industrial fires).
- USFWS and the SCC shall minimize idling time to 5 minutes for all heavy-duty equipment when not engaged in work activities, including on-road haul trucks while being loaded or unloaded on-site.
- Staging areas and equipment maintenance activities shall be located as far from sensitive receptors as possible.

In addition, where feasible and applicable, USFWS and the SCC shall do the following:

- Establish an activity schedule designed to minimize traffic congestion around the construction site.
- Periodically inspect construction sites to ensure construction equipment is properly maintained at all times.
- Require the use of low-sulfur fuel (diesel with 15 parts per million or less).
- Utilize United States Environmental Protection Agency (EPA)-registered particulate traps and other appropriate controls to reduce emissions of diesel particulate matter and other pollutants at the construction site.

SBSP Mitigation Measure 3.14-3b: Health and Safety Plan

The landowners and/or their contractors shall prepare a Health and Safety Plan that includes project-specific monitoring procedures and action levels for dust. The portion of the plan that relates to the control of toxic contaminants contained in fugitive dust shall be prepared in coordination with BAAQMD. The recommendations of BAAQMD to prevent the exposure of sensitive receptors to levels above applicable thresholds (probability of contracting cancer for the Maximally Exposed Individual [MEI] that exceeds 10 in one million or if ground level concentrations of non-carcinogenic contaminants result in hazard index greater than one for the MEI) shall be implemented. The Health and Safety Plan, applicable to all excavation activities, shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials (including notification procedures to nearby sensitive receptors within 1,000 feet informing them of construction activities that may generate dust containing toxic contaminants). The plan shall be prepared according to federal and California Occupational Safety and Health Administration (OSHA) regulations. The landowners and/or its contractors shall maintain a copy of the plan on-site during construction activities.

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3. ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.1 Introduction

3.1.1 Chapter Organization

The sections in Chapter 3 are organized into three broad categories: Physical Environment, Biological Environment, and Social and Cultural Environment. A fourth category, the South San Francisco Bay Shoreline Study, was included as Section 3.2 in the 2007 South Bay Salt Pond (SBSP) Restoration Project Programmatic Environmental Impact Statement/Environmental Impact Report (2007 EIS/R), but it was summarized in a few paragraphs in Chapter 1 of this document and is not included in Chapter 3 of this Final EIS/R. Sections 3.2 through 3.17 present the environmental setting, impacts, and mitigation measures for the SBSP Restoration Project, Phase 2. Topics addressed in these sections are required by the National Environmental Policy Act (NEPA) and/or the California Environmental Quality Act (CEQA). The environmental resource sections for each of these categories are listed below.

Physical Environment

3.2 Hydrology, Flood Management, and Infrastructure

3.3 Water Quality

3.4 Geology, Soils, and Seismicity

Biological Environment

3.5 Biological Resources

Social and Cultural Environment

3.6 Recreation Resources

3.7 Cultural Resources

3.8 Land Use

3.9 Public Health and Vector Management

3.10 Socioeconomics and Environmental Justice

3.11 Traffic

3.12 Noise

3.13 Air Quality

3.14 Public Services

3.15 Utilities

3.16 Visual Resources

3.17 Greenhouse Gas Emissions

Each of the above sections in Chapter 3 (Sections 3.2 through 3.17) is divided into three parts: Physical Setting, Regulatory Setting, and Environmental Impacts and Mitigation Measures. These are described in further detail below. Cumulative effects for each of the environmental resources listed above are evaluated in Chapter 4.

3.1.2 Environmental Setting and Impact Analysis

Physical Setting

The physical setting includes the regional setting as well as the project setting. The regional setting presents the existing conditions within the greater South Bay for the environmental topic. In most cases, the regional setting covers the SBSP Restoration Project area. In other cases, the regional setting provides information on a broader area extending beyond the immediate project vicinity (e.g., geology). The 2007 EIS/R covered the regional setting in great detail, and so this project-level document does not focus on that and instead includes it only to the extent necessary for that resource impact analysis.

The project setting provides the existing conditions specific to the SBSP Restoration Project's Phase 2 alternatives for each environmental topic. Project setting information is presented for each of the two SBSP Restoration Project pond complexes (Alviso and Ravenswood) and the Phase 2 pond clusters within them.

Regulatory Setting

Where the SBSP Restoration Project's Phase 2 ponds fall within the jurisdiction of federal, state, and local regulatory agencies, the project would be subject to the laws, regulations, and policies of those agencies. These regulations are intended to guide development to reduce adverse effects on sensitive resources, or offer general guidance on the protection of such resources. The regulatory framework sections describe the rules that may be applicable to Phase 2 for each issue area. These rules may also set the standards (significance criteria or thresholds of significance, as described below) by which potential project impacts are evaluated.

Environmental Impacts and Mitigation Measures

Significance Criteria

The Environmental Impacts and Mitigation Measures section presents the significance criteria (also referred to as thresholds of significance under CEQA) against which potential effects are evaluated and the potential impacts that would result from implementation (construction and operation) of the Phase 2 No Action Alternatives and the Phase 2 Action Alternatives. (The equivalent CEQA terms are "No Project Alternatives" and "project alternatives," but the NEPA terms will be used throughout.)

As defined by CEQA Guidelines 15064.7(a), a threshold of significance is an identifiable quantitative, qualitative, or performance standard for a particular environmental effect. Although the Council of Environmental Quality (CEQ) Regulations for Implementing NEPA do not identify any specific criteria for evaluating impacts, NEPA regulations adopted by the federal lead agencies were considered as the significance criteria were developed. The significance criteria against which the Phase 2 Action

Alternatives are assessed include the criteria listed in Appendix G of the CEQA Guidelines and the specific criteria provided in the 2007 EIS/R. The criteria have been updated to address newer CEQA requirements; to be geographically specific, where appropriate; and to address SBSP Restoration Project–specific topics.

The significance criteria presented in this Final EIS/R provide rational bases for determining whether the SBSP Restoration Project would have significant environmental effects and as such, are presented before the evaluation of potential effects in Sections 3.2 through 3.17.

Characterization of Impact Significance

Impact evaluations for the Action Alternatives are assessed based on the existing conditions (existing baseline) at each Phase 2 pond cluster, not the conditions anticipated to occur or develop under the No Action Alternative. This approach is consistent with the CEQA Guidelines and the approach used in the 2007 EIS/R.

In determining the significance of impacts, many CEQA documents generally categorize impacts as "significant" or "less than significant" based on stated significance criteria. CEQA defines significance as a substantial or potentially substantial adverse change to the environment (Section 15382). The definition of significant in terms of what is a "substantial" or significant effect is left to the lead agencies to determine. In CEQA, the point at which the severity of an impact changes from less than significant to significant is called the significance threshold (see discussion of significance criteria, above).

Pursuant to Section 1508.27 of the CEQ Regulations for Implementing NEPA, "significantly" as used in NEPA requires consideration of both context and intensity. Context can include the society as a whole (human, national), the affected region, the affected interests, and the locality. Intensity refers to the severity of impact.

In this Final EIS/R, the context is explained in the impact discussions presented in Sections 3.2 through 3.17. The intensity or severity of impacts is generally characterized using CEQA terminology. To determine whether impacts might be significant, potentially adverse impacts are identified and evaluated using the significance criteria developed for each environmental resource.

Although CEQA focuses on adverse impacts, NEPA addresses both adverse and beneficial impacts. Section 1508.8 of the CEQ Regulations for Implementing NEPA states that "effects [or impacts] may also include those resulting from actions which may have both beneficial and detrimental effects." Consequently, this Final EIS/R identifies both potentially adverse and potentially beneficial impacts of the SBSP Restoration Project. The following terms are used in this Final EIS/R to characterize project impacts:

- Potentially significant: Adverse environmental effects would occur (impacts would exceed the significance criteria or thresholds defined for each environmental issue), and no mitigation measures are available to reduce impacts to levels below the significance criteria. In other documents, these are often described as "potentially significant and unavoidable"
- Less than significant with mitigation: Potentially adverse environmental effects would occur, but mitigation measures would be implemented to reduce adverse effects to less-than significant levels.
- Less than significant: Environmental effects would not exceed the significance criteria.

- No impact: No adverse environmental effects would occur.
- Beneficial (NEPA only): No adverse environmental effects would occur, and conditions would improve, creating a beneficial effect.

Both NEPA and CEQA address the potential for mitigation to reduce environmental impacts. CEQA states that "an EIR shall describe feasible measures which could minimize significant adverse impacts" (CEQA Guidelines Section 15126.4[a][1]). According to Section 1508.20 of the CEQ Regulations for Implementing NEPA, mitigation is intended to do one of the following:

- Avoid the effect or impact altogether by not taking a certain action or parts of an action;
- Minimize the effect or impact by limiting the degree or magnitude of the action and its implementation;
- Rectify the effect or impact by repairing, rehabilitating, or restoring the affected environment; or
- Reduce or eliminate the effect or impact over time by preservation and maintenance operations during the life of the action.

A significant impact that cannot be mitigated to a less than significant level is considered unavoidable.

Presentation of Impacts

In Sections 3.2 through 3.17 of this Final EIS/R, the impacts of the SBSP Restoration Project, Phase 2, long-term alternatives are presented in the following order for each impact and for each of the four pond clusters:

- Phase 2 No Action Alternative; and
- Phase 2 Action Alternatives.

Project-level impacts are presented as Phase 2 Impact 3.X-Y, where X is the section number and Y is impact number. The project-level impacts detail the specific design information that was developed for use in the impact evaluation. To the extent possible, quantitative analyses are provided for the project-level impact analyses. All impact analyses consider changes in the environment over the 50-year planning period.

Adaptive Management Plan and its Relationship to the Impact Analysis

As stated in Chapters 1 and 2 of this Final EIS/R, the Adaptive Management Plan (AMP) is an integral component of the SBSP Restoration Project, Phase 2. The AMP allows for lessons learned from earlier phases to be incorporated into subsequent phases as management plans and designs for future actions are made. As importantly, it also allows the decisions about the specific actions and components of each project phase to be made based on the outcomes of previous project phases and to adjust the balance of restoration options between tidal marsh and enhanced managed ponds as needed to avoid significant impacts to one species. This approach to phased tidal restoration acknowledges that uncertainties exist and provides a framework for adjusting management decisions as understanding of the cause-and-effect linkages between management actions and the physical and biological response of the system are more fully understood. Adaptive management is used to maximize the ability to achieve the Project Objectives (benefits). Another key aspect of the adaptive management approach is to avoid adverse environmental impacts by triggering specific pre-planned intervention measures if monitoring reveals that aspects of the ecosystem are evolving (responding to prior interventions) along undesirable trajectories.

Monitoring key attributes of the physical, chemical, and biological conditions of the South Bay ecosystem may detect early signs of unexpected or uncertain adverse effects. The AMP identifies management triggers that indicate when restoration actions may cause a significant adverse environmental impact. The management triggers are intended to provide a warning to decision-makers before a significant impact occurs. If a management trigger is tripped, the restoration would be halted or modified until a focused evaluation is conducted to assess if a potentially significant impact would result from the SBSP Restoration Project or other factors. If the focused evaluation determines that the SBSP Restoration Project would cause a significant impact, an adaptive management action to avoid the significant impact would be implemented. Ongoing monitoring would determine the effectiveness of the adaptive management action. The project decision-makers would use these results to determine whether the progression along the restoration "staircase" should continue (i.e., additional tidal restoration should occur). If the focused evaluation and/or monitoring results indicate that a significant impact would still occur, even with implementation of the adaptive management action, then additional tidal restoration activities would cease. This cessation could happen at any point along the restoration staircase (described in more detail in the Executive Summary of the 2007 EIS/R) between the Alternatives B and C bookends of 50 percent tidal marsh/50 percent managed ponds and 90 percent tidal marsh/10 percent managed ponds.

As mentioned above, triggers were developed and selected to provide the opportunity to modify the phasing and design of future phases or change pond management before thresholds of significance are exceeded. These decisions about future restoration options (e.g., choosing whether a particular salt pond would be restored to a tidal marsh or retained and enhanced as a managed pond) and the designs and plans that would go into them are termed "staircase" issues because they address where on the staircase between the pre-project conditions and the 90 percent/10 percent balance the SBSP Restoration Project might ultimately stop. Many of the resources that could be impacted by the project are directly affected by these staircase-issue decisions. These include weighing the habitat needs of pond-dependent bird species against marsh-dependent species, or balancing the goal of providing public access and recreation features with the need to not disturb sensitive wildlife species. The AMP provides a formal context in which to evaluate these aspects of the staircase issues and how they would be shaped by the selection and implementation of actions in each phase of the SBSP Restoration Project. Consequently, many of the most wide-reaching and long-term potentially significant impacts identified in this Final EIS/R would be avoided through implementation of the AMP.

The adaptive management approach similarly ensures that no significant impacts would occur in association with construction and/or operation of the project. As such, the AMP is not a mitigation measure identified in this Final EIS/R to reduce potentially significant impacts, but rather it is an integral part of the project that would avoid significant impacts through the restoration triggers-management actions feedback loop.

For the other environmental issue areas that the AMP does not address (e.g., non-staircase issues such as air quality), mitigation measures are identified (as needed) to reduce potentially significant impacts to less than significant levels. If feasible mitigation measures are not identified for a potentially significant impact concerning a non-staircase issue, then it would remain potentially significant.

Phase 2 No Action Alternatives

The Phase 2 No Action impact discussion presents a project-level evaluation of the No Action Alternative at each pond cluster. In general, and as listed and explained in Chapter 2, these No Action Alternatives are named with the letter "A" following the name of the pond cluster in which it would occur (e.g., the No Action Alternative at the Alviso-Island Ponds is named "Alternative Island A").

The Phase 2 No Action Alternatives focus on the environmental changes that would occur if the Phase 2 actions were not implemented in those locations. These ponds are currently managed under the general principles and practices described in Programmatic Alternative C; therefore, the Phase 2 No Action Alternatives would result in the continued implementation of Programmatic Alternative C at these ponds.

Programmatic Alternative C was selected and is being implemented for the SBSP Restoration Project as a whole. Yet at any particular pond cluster, it would be possible to select a No Action Alternative under Phase 2 and still move forward with a Phase 2 action alternative at other pond clusters. In some cases, geographic distinctions are identified that are unique to the Phase 2 ponds. Where there are similarities between the impacts resulting from Programmatic Alternative A and the Phase 2 No Action Alternatives, the program-level discussions from the 2007 EIS/R are referenced.

Phase 2 Action Alternatives

The Phase 2 actions are the second phase of long-term Programmatic Alternatives B and C. Because potential impacts from implementation of the Phase 2 actions would generally be similar to those identified for Alternatives B and C, many of the impacts and mitigation discussions are similar. To reduce redundancy, impact discussions and mitigation measures presented in the 2007 EIS/R for the SBSP Restoration Project long-term alternatives are referenced in the Phase 2 impact discussions to the extent possible. Also, as noted in Chapter 2, program-level mitigation measures from the 2007 EIS/R have been adopted and incorporated into the designs at the project level, making them part of the project and not a mitigation measure.

Avoidance and Minimization Measures for Less than Significant Impacts

As discussed above, impacts of Phase 2 of the SBSP Restoration Project are characterized as potentially significant, less than significant with mitigation, less than significant, no impact, or beneficial. Where potential impacts are considered to be less than significant, effects would not exceed the identified thresholds, and mitigation measures were not identified in Chapter 3's resource-specific Sections 3.2 through 3.17, to further reduce impacts.

Three categories of less than significant impacts were identified in Chapter 3 of the 2007 EIS/R and are described below. This section reviews the availability or absence of mitigation measures that would further reduce less than significant impacts.

- **Impacts that would be reduced to less than significant levels with the implementation of management actions identified in the Adaptive Management Plan.** The AMP, presented in Appendix C of the 2007 EIS/R and summarized in Section 2.3 of that document and again in this Final EIS/R, identifies management actions that are intended to optimize environmental resources affected by the project and reduce impacts to acceptable, less than significant levels. These management actions address sediment dynamics, water quality, biological resources, and recreation and public access. The AMP identifies management triggers that would be tripped before a significant environmental impact occurs in order to warn decision-makers and give them time to implement the appropriate management actions to address the potential impact. These management actions would generally be applied even if management triggers are not tripped, to further improve environmental conditions for the resource areas addressed by the AMP.

- **Impacts that would be considered less than significant with implementation of mitigation measures identified in the Final EIS/R.** Certain impacts that are identified as potentially significant would be reduced to less than significant levels with implementation of mitigation measures. Because these mitigation measures include a variety of Best Management Practices that would cumulatively achieve greater reduction than the minimum acceptable to reach the less than significant threshold, the implementation of these mitigation measures would likely be effective in further reducing the impact.

- **Impacts that are so minor that additional mitigation measures are not warranted or impacts where no additional measures would be feasible.** This category of impacts covers the remaining less than significant impacts of the project

3.1.3 Baseline Conditions

Baseline conditions are typically "the physical environmental conditions in the vicinity of the Project, as they exist at the time the Notice of Preparation (NOP) is published" (CEQA Guidelines Section 15125(a)). However, given that the 2007 EIS/R, on which this document is tiered, was published in 2007, more than 8 years before the Phase 2 Final EIS/R is scheduled to be released, the baseline conditions described in the 2007 EIS/R were updated as needed. The NOP for Phase 2 was published in September 2013, and for the purposes of this Final EIS/R, the baseline conditions are set in Fall 2013. For this timeline, the Phase 1 actions are complete and are included in the baseline conditions.

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3.2 Hydrology, Flood Management, and Infrastructure

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) characterizes the existing hydrology and flood management within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on hydrological resources. The information presented is based on review of federal, state and local plans, and other pertinent regulations, which are presented in the regulatory framework setting section. Using this information as context, an analysis of the hydrology, flood management, and infrastructure environmental impacts of the project is presented for each alternative. Program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of the project. Therefore, this section only includes additional mitigation measures as needed.

3.2.1 Physical Setting Methodology

The development of the baseline conditions, significance criteria, and impact analysis is commensurate with and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). The baseline condition specific to the Phase 2 ponds is based on current conditions in these areas, which include Phase 1 actions and actions implemented under the Initial Stewardship Plan (ISP). The primary sources of data used to describe recent conditions include SBSP Self-Monitoring and Mitigation Monitoring Reports (SCVWD et al. 2010).

3.2.2 Regional Setting

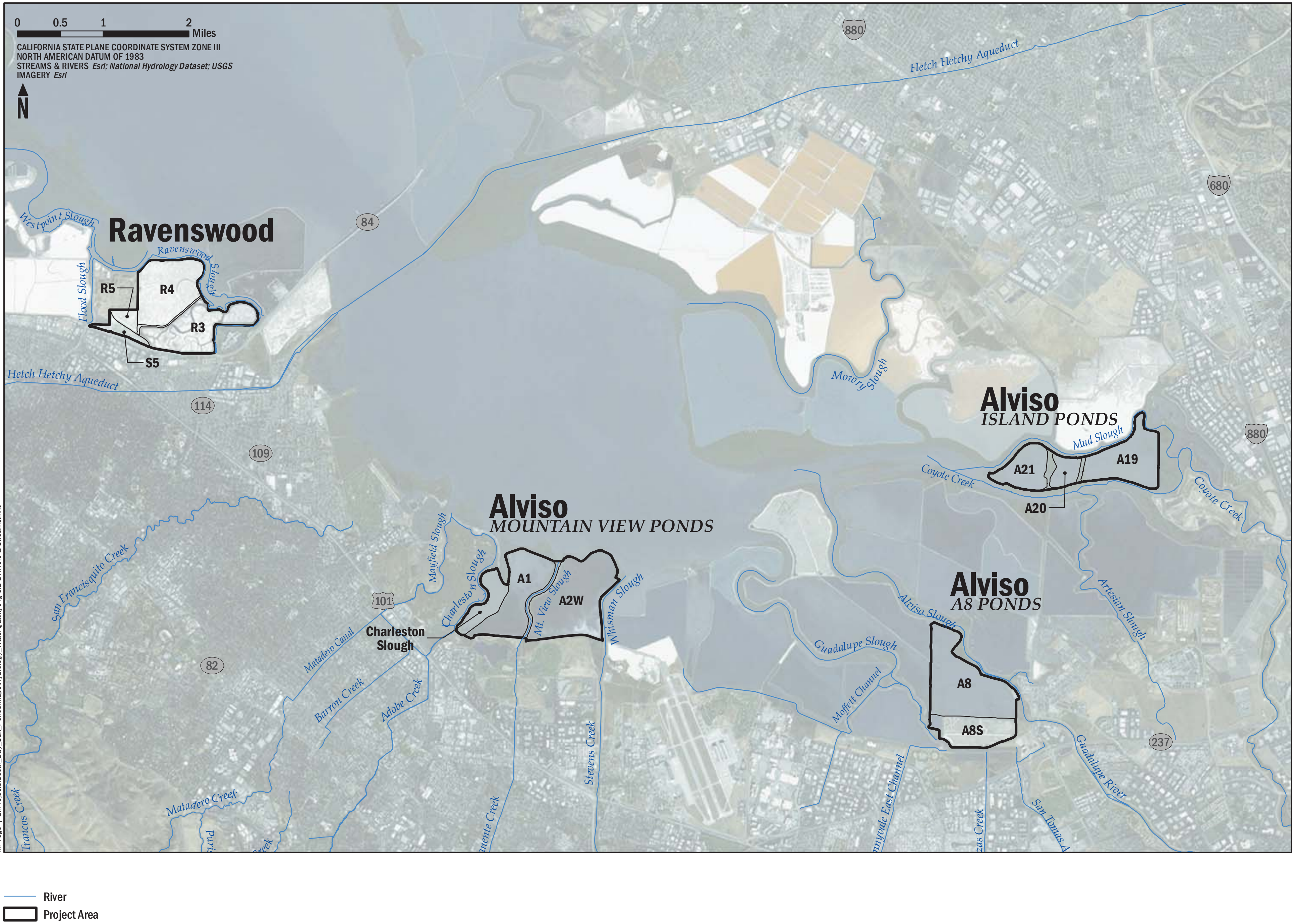
The regional setting provides information regarding the South San Francisco Bay (South Bay), the Alviso pond complex, the Ravenswood pond complex, and upland watersheds (see Figure 3.2-1).

South San Francisco Bay

The South Bay is defined as the portion of San Francisco Bay south of Coyote Point on the western shore and San Leandro Marina on the eastern shore. The South Bay is both a geographically and hydrodynamically complex system, with freshwater tributary inflows, tidal currents, and wind interacting with complex bathymetry (i.e., bed surface elevation below water).

Climate and Precipitation. The South Bay, like much of California's Central Coast, experiences a Mediterranean climate characterized by mild, wet winters and dry, warm summers. Air temperatures are mild due to proximity to the ocean. Winter weather is dominated by storms from the northern Pacific Ocean that produce nearly all the annual rainfall, while summer weather is dominated by sea breezes caused by differential heating between the hot interior valleys and the cooler coast. The South Bay typically receives about 90 percent of its precipitation in the fall and winter months (October through April), with the greatest average rainfall occurring in January. The average annual rainfall in the counties surrounding the South Bay is approximately 20 inches, although the actual rainfall can be highly variable due to the influence of local topography.

Hydrodynamics. The South Bay can be characterized as a large shallow basin, with a relatively deep main channel surrounded by broad shoals and mudflats. Tidal currents, wind, and freshwater tributary inflows interact with bathymetry to define the residual circulation patterns and residence time, and determine the



URS
South Bay Salt Pond Restoration Project

Figure 3.2-1
Rivers & Streams

level of vertical mixing and stratification. The most obvious hydrodynamic response is the daily rise and fall of the tides, although much slower residual circulation patterns also influence mixing and flushing processes within the South Bay.

The tides in San Francisco Bay are mixed semidiurnal tides (i.e., two high and two low tides of unequal heights each day). The tides exhibit strong spring-neap variability with the spring tides, which have a larger tidal range, occurring approximately every 2 weeks during the full and new moon. Neap tides, which have a smaller tidal range, occur approximately every 2 weeks during the moon's quarter phases. The tides also vary on an annual cycle, in which the strongest spring tides occur in late spring/early summer and late fall/early winter, and the weakest neap tides occur in spring and fall. The enclosed nature of the South Bay creates a mix of progressive and standing wave behavior, which causes tidal amplification as waves move southward (i.e., the tidal amplitude is increased by the harmonic addition of original waves plus reflected waves).

One of the most important factors influencing circulation patterns in the South Bay is bathymetry. Bathymetric variations create different flow patterns between the San Mateo Bridge and Dumbarton Bridge and in areas south of the Dumbarton Bridge. Circulation patterns also differ between the deep main channel and the expansive shoals. Currents in the South Bay are driven predominantly by tidally and wind-forced flows and their interaction with the bathymetry. Typically, winds drive a surface flow, which then induces a return flow in the deeper channels (Walters et al. 1985). In terms of circulation, the most significant winds are onshore breezes that create a horizontal, clockwise circulation pattern during the spring and summer. Density-driven currents occur when adjacent water bodies have differing densities, such as differences in temperature and/or salinity. Although density-driven currents are generally uncommon in the South Bay, in years of heavy rainfall, fresh water can flow from the Delta through the Central Bay and into the South Bay (Walters et al. 1985). In such events, the freshwater flows southward along the surface, while the more saline South Bay water flows northward along the bottom.

Currents and circulation affect the tidal excursion – the horizontal distance a water particle travels during a single flood or ebb tide. The tidal excursion varies between 6.2 and 12.4 miles within the main channels, and it ranges between 1.9 and 4.8 miles within the subtidal shoals; much smaller excursions occur on the intertidal mudflats (Cheng et al. 1993; Fischer and Lawrence 1983; Walters et al. 1985). Tidal dispersion is the dominant form of transport in the South Bay and the primary mechanism that controls residence times. Residence time is usually characterized as the average length of time a water parcel spends in a given waterbody or region of interest (Monsen et al. 2002). It is typically shorter during the winter and early spring during wet years and considerably longer during summer and/or drought years (Powell and Huzzey 1989; Walters et al. 1985). Residence time also varies with seasonal freshwater inflow and wind conditions.

The volume of water in the South Bay between mean low water and mean high water is the "tidal prism" of the South Bay. Tidal prism, in combination with bathymetry, determines the patterns and speed of tidal currents and subsequent sediment transport. The tidal prism for the South Bay is approximately 666,000 acre-feet, the majority of which is contained between the San Francisco-Oakland Bay Bridge and San Mateo Bridge (Schemel 1995). At mean lower low water, the volume of water in the far South Bay (south of the Dumbarton Bridge) is less than half the volume present at mean higher high water (MHHW). In addition, surface water area coverage at mean lower low water is less than half that at MHHW, indicating that over half of the far South Bay consists of shallow mudflats exposed at low tides (Schemel 1995).

Sea-Level Rise. Sea level rise refers to an increase in mean sea level with respect to a land benchmark. Global sea-level rise can be a result of global warming from the expansion of sea water as the oceans warm or from the melting of ice over land. Local sea-level rise is affected by global sea-level rise plus tectonic land movements and subsidence, which can be of the same order as global sea-level rise.

Atmospheric pressure, ocean currents, and local ocean temperatures also affect local rates of sea-level rise.

Salinity. Salinity in the South Bay is governed by salinity in the Central Bay, exchange between the South Bay and Central Bay, freshwater tributary inflows to the South Bay, and evaporation. In general, the South Bay is vertically well mixed (i.e., there is little tidally averaged vertical salinity variation) with near oceanic salinities (33 parts per thousand [ppt]. Exceptions include areas within the far South Bay below the Dumbarton Bridge, which can remain brackish year-round due to wastewater treatment plant discharges.

Seasonal variations in salinity are driven by variability in freshwater inflows. High freshwater inflows typically occur in winter and early spring in wet years when fresh water from the San Francisco Bay Delta (Delta) intrudes into the South Bay. For example, during wet years when Delta outflow exceeds approximately 200,000 cubic feet per second (cfs), fresh water from the Delta intrudes into the South Bay during the winter and spring months, pushing surface salinities below 10 ppt. During dry years when Delta outflows are small, near surface salinity in the South Bay remains high (> 20 ppt) (PWA et al.

2005a). As Delta and tributary inflows decrease in late spring, salinity increases to near oceanic salinities. High freshwater inflows can result in circulation patterns driven by density gradients between the South Bay and Central Bay (Walters et al. 1985).

Sediment Characteristics. Bay habitats such as subtidal shoals, intertidal mudflats, and wetlands are directly influenced by sediment availability, transport and fate, specifically the long-term patterns of deposition and erosion. The main losses of sediment from the South Bay are exports to the Central Bay and sediment capture within marsh areas and restored ponds. Sediments carried on flood tides into a marsh or restored pond are typically deposited, causing the marsh or mudflat area to increase in elevation. Sediments can also be carried out with ebb tides if cohesive sediment deposition is inhibited. The rate of sedimentation a marsh or restored pond depends on the suspended sediment concentration (SSC) near the marsh or restored pond location, the elevation of the ground surface, and the degree of tidal exchange.

The capacity of many sloughs and channels in the South Bay has been gradually reduced by sediment deposition. Under natural conditions, channels adjacent to marsh lands experienced daily scouring from tidal flows. When these areas were diked off to create salt ponds, the scouring flows were reduced.

Subsequent sedimentation has constricted channels, reducing cross-sectional areas and decreasing channel conveyance. Although the South Bay as a whole has undergone periods of net deposition and net erosion, the far South Bay below Dumbarton Bridge has remained largely depositional since bathymetric data collection began in 1857 (Foxgrover et al. 2004; Foxgrover et al. 2007; Krone 1996; Shellenbarger et al. 2013).

Suspended sediment concentrations in the South Bay exhibit short-term variability, primarily in response to variations in tidally driven resuspension, wind-driven resuspension, and riverine input from local tributaries and sloughs (Schoellhamer 1996). In the winter and early spring, the main sources of suspended sediments are local tributaries and the Central Bay. For example, extremely wet years candeliver turbid plumes of sediment from the Delta into the South Bay. This influx of sediment enters the system and is continually reworked and transported as it is deposited and resuspended by tidal and wind- driven currents. There is typically little direct input of suspended sediment in the dryer summer months; however, SSCs are often high due to increased wind-wave resuspension and reworking of previously deposited sediments. In recent, years, Shellenbarger et al (2014) have collected sediment flux data in the Alviso Slough. Their results show that winter storms and associated runoff have the greatest influence on sediment flux. Strong spring tides promote upstream sediment flux, and the weaker neap tides have a smaller net flux. During these neap tides, sediment transport during their weaker flood and ebb tides is suppressed by stratification of the water column, which dampens turbulence and limits sediment resuspension.

The transport and fate of suspended sediment has the potential to affect the transport and fate of contaminants, such as metals and pesticides, and the distribution of nutrients. Increasing SSCs are also directly correlated with increasing turbidity and decreasing light availability, thus affecting photosynthesis, primary productivity, and phytoplankton bloom dynamics.

Flood Hazards. Flood hazards in the South Bay result primarily from coastal flooding (tides, storm surge and wind wave action) and fluvial flows (rainfall-runoff) from the adjacent watersheds. Flooding can also be caused by backed-up storm drains or, much less commonly, by tsunamis or seiche waves.

Coastal flooding normally results from exceptionally high astronomical tides, increased by storm surge[1], climatic events, and wind wave action. Coastal flooding can occur when high Bay water levels, in concert with wind waves, lead to erosion and/or overtopping of coastal barriers. The highest astronomic tides occur for a few days each summer and winter due to the relative positions of the earth, moon, and sun.

The highest Bay water levels typically occur in the winter when storm surges are coincident with the higher astronomic tides. Salt ponds in the South Bay dissipate incident wind-wave action and act as large reservoirs to store overtopped waters. Floods resulting solely from coastal processes have been rare due to the de facto flood protection provided by existing pond levees (USACE 1988). Note that, while the term “levee” is used to describe these features of the former salt production infrastructure throughout this Final EIS/R and in the SBSP Restoration Project as a whole, these features were never engineered or constructed to provide flood protection and are more like berms than true flood levees.

Fluvial flooding occurs when rivers, creeks, and other natural or constructed channels are overtopped. Fluvial flooding has been the primary source of historical flood damage in developed areas adjacent to the South Bay. An extensive network of flood control levees has been constructed along various channel reaches to protect adjacent developed areas from channel overtopping. These leveed reaches are designed to convey large fluvial discharges during high Bay tides; however, the levees can be overtopped when high runoff conditions and high Bay tides exceed the design capacity of the leveed channel. Out-of-bank flooding can also occur in areas adjacent to non-leveed channels when the runoff exceeds the carrying capacity of the channel. Flooding also results from local drainage that collects behind bayfront levees when discharges to the Bay (either by pumps or gravity flow) are inadequate[2].

Tsunamis are another potential coastal flooding hazard in the South Bay. Borrero et al. (2006) evaluated historical and hypothetical tsunami-induced wave heights in San Francisco Bay, focusing on the Central

[1] Storm surge is an increase in water level caused by atmospheric effects and strong winds over shallow areas, which combine to raise water elevations along the shore.
[2] For example, local flooding related to inadequate drainage systems regularly occurs at Redwood City’s Bayfront Canal and Atherton Channel when Flood Slough is at high tide.

and North Bay. The largest hypothetical tsunami-induced wave was caused by a very large earthquake (greater than 9.0 on the Richter scale) on the Alaska-Aleutian subduction zone. Modeling results predicted a 16.4-foot wave entering San Francisco Bay, but the wave height was quickly reduced to less than 3.2 feet as it passed under the San Francisco–Oakland Bay Bridge. The modeling study did not extend to the far South Bay below the Dumbarton Bridge; however, previous relationships suggest that tsunami-induced wave heights in the far South Bay would be reduced to less than 10 percent of the wave heights at the Golden Gate Bridge.

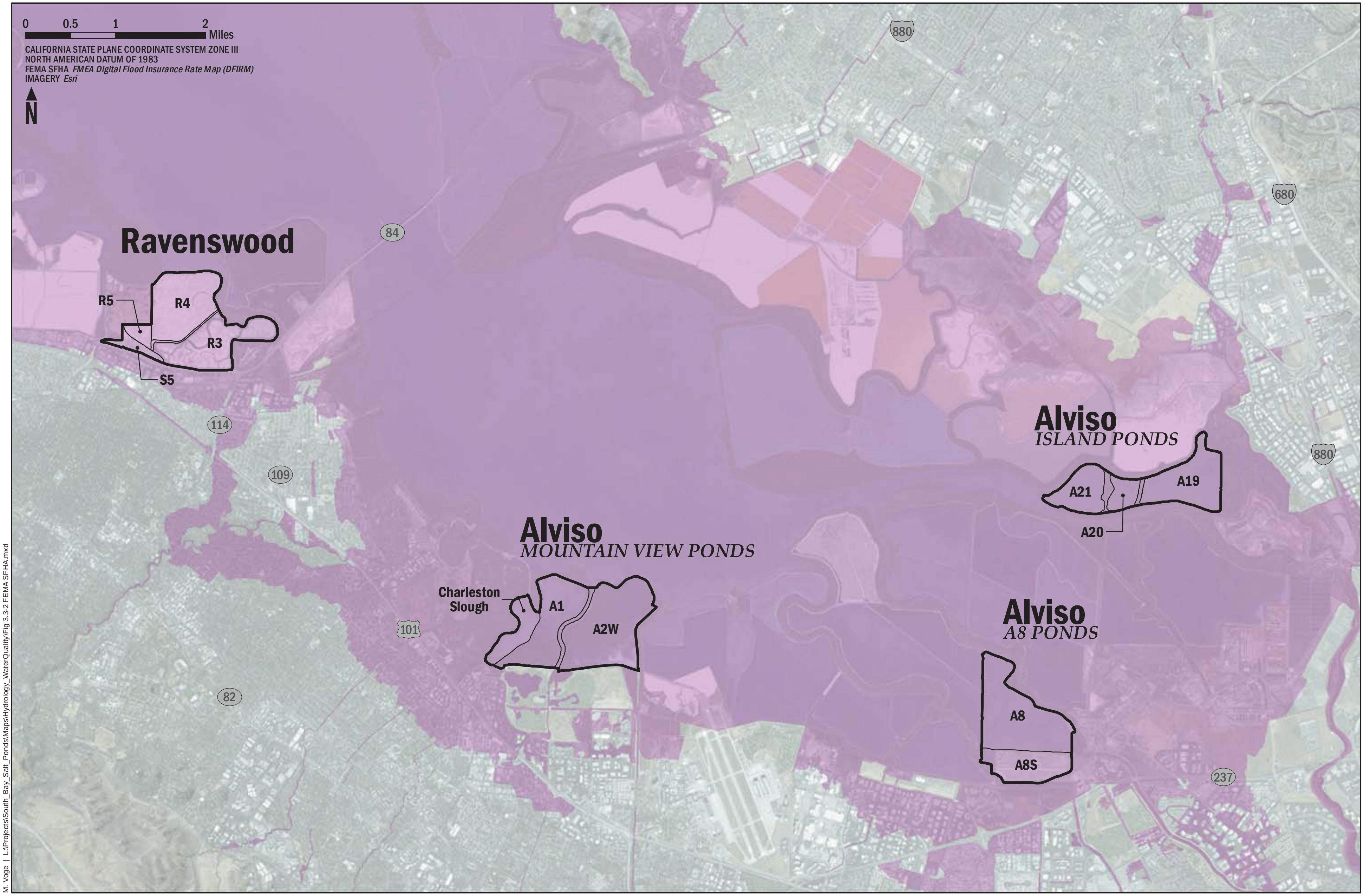
Levees. Levees in the far South Bay, and specifically levees in the SBSP Restoration Project area, were typically constructed with Bay mud (weak clays and silts) dredged from adjacent borrow ditches or pond areas. Soils were not compacted during levee construction, and levees have continued to settle and deform. These levees have been augmented from time to time with Bay mud fill to compensate for subsidence, consolidation of levee fill material, and weak underlying Bay mud deposits. In general, levees are low to moderate in height and have fairly flat, stable slopes. Some dikes were constructed from imported soil, riprap, broken concrete, and other predominantly inorganic debris, and these dikes typically have steeper slopes than the levees constructed of Bay mud.

Outboard levees (i.e., bayfront and slough/creek levees adjacent to tidal waters) were built to enclose evaporation ponds on former tidal marshes and mudflats and to protect the salt ponds from Bay inundation. Inboard levees (i.e., inland pond levees) are predominantly former salt pond levees that offer the last line of defense against flooding of low-lying inland areas. Internal levees separate the individual salt ponds from each other and are typically smaller than the outboard levees. Generally, pond levees were not designed, constructed, or maintained following well-defined standards (USACE 1988).

Existing levees provide a measure of flood protection, and former salt ponds act as temporary storage during coastal flooding conditions. Waves break against outboard levees, which can be safely overtopped. As ponds fill, waves overtop internal levees sequentially, reducing flood-protection capabilities. If tidal action is introduced to the salt ponds, either through restoration or passively through deterioration of the levees, the effectiveness of the salt pond complexes as flood-protection mechanisms is substantially reduced. Although most of the shoreline in the South Bay consists of levees that do not meet the Federal Emergency Management Agency (FEMA) or the United States Army Corps of Engineers (USACE)

flood-protection standards, the absence of a history of significant tidal flooding indicates that these levees do provide some level of flood protection (USACE 1988).

Floodplains. FEMA and USACE have developed flood maps for the South Bay that include delineation of the 100-year floodplain. FEMA delineation of the coastal floodplain in the South Bay (see Figure 3.2-2) is based on the assessment that pond levees provide for a reduction of wave action but do not prevent inundation from high Bay water levels. Therefore, FEMA-designated 100-year base flood elevations are a function of the 100-year still-water elevations. The still-water flood elevation is defined by FEMA as the projected elevation that floodwaters would assume in the absence of waves resulting from wind or seismic effects. For fluvial systems, FEMA determines the 100-year base flood elevations by using the MHHW as the downstream tidal water surface elevation (tidal boundary) coupled with the 100-year flood for upstream flow conditions. The FEMA floodplain data shown on Figure 3.2-2 are from Flood Insurance Rate Maps (FIRMs) effective in 2009 (Santa Clara and Alameda Counties) and 2012 (San Mateo County).



LEGEND

Special Flood Hazard Area

Project Area

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South Bay Salt Pond Restoration Project

Figure 3.2-2

FEMA Special Flood Hazard Areas

The USACE report for San Francisco Bay Shoreline Study: Southern Alameda and Santa Clara Counties, interim (USACE 1988) presents both a “worst-case” scenario and a “most likely” condition in defining the 100-year coastal floodplain. The “worst-case” scenario assumes that all low-lying areas that are not completely protected from tidal flooding would be flooded during extreme high tides to the elevation of the tide. The USACE “most likely” condition evaluated the extent of tidal flooding most likely to occur given the existence of the salt ponds, pond levees, high ground, and other non-engineered and engineered levees. (The Ravenswood pond complex was outside of the USACE study area and was not included by USACE in its 100-year coastal floodplains.)

In general, pond levees would not meet FEMA criteria and are not certified as flood-protection facilities as defined in FEMA’s certification requirements (FEMA 1998). This is because (1) levee failure comprised of overtopping, degradation, and breaching is likely to result in flooding of inland areas[3], and there are no calculations to show that they are designed for the 100-year event, and (2) maintenance records indicate frequent maintenance is required, but the required maintenance program for certification, including a commitment by a public entity, does not exist.

Tsunami and Seiche. Tsunamis are long-period, low-amplitude ocean waves that pose an inundation hazard to many coastal areas around the world. Tsunami waves are generated when the floor of an ocean, sea, bay, or large lake is rapidly displaced on a massive scale. While the wave height of a tsunami in the open ocean is generally low, the tsunami waves change shape as the seafloor ramps up near coastlines and water depth becomes shallow, trapping wave energy and potentially causing the wave height to increase dramatically. Tsunami waves at coastlines can range in size from barely perceptible on tide gauge recordings to heights upwards of 30 meters. Upon reaching the coastline, the momentum of the tsunami waves may carry them inland for some distance, and they may run up on land to elevations greater than the wave height at the coast.

Borrero et al. (2006) evaluated historical and hypothetical tsunami-induced wave heights in San Francisco Bay, focusing on the Central Bay and the North Bay. The largest hypothetical tsunami-induced wave was caused by a very large earthquake (greater than 9.0 on the Richter scale) on the Alaska-Aleutian subduction zone. Modeling results predicted a 16.4-foot wave entering San Francisco Bay, but the wave height was quickly reduced to less than 3.2 feet as it passed under the San Francisco–Oakland Bay Bridge. The modeling study did not extend to the far South Bay below the Dumbarton Bridge; however, previous relationships suggest that tsunami-induced wave heights in the far South Bay would be reduced to less than 10 percent of the wave heights at the Golden Gate Bridge.

A seiche is a wave that oscillates in lakes, bays, or gulfs from a few minutes to a few hours as a result of seismic or atmospheric disturbances. The geometry of the basin and frequency of oscillation have the potential to amplify the waves. Tsunami waves can create seiches when they enter embayments.

Alviso Pond Complex

The Alviso pond complex consists of 25 ponds in the South Bay within Santa Clara and Alameda counties. The complex covers 8,000 acres and is owned and operated by the U.S. Fish and Wildlife Service (USFWS). The pond complex is bordered on the west by the Palo Alto Baylands Park and Nature Preserve and the City of Mountain View’s Charleston Slough; on the south by commercial and industrial

[3] Analysis was conducted by USACE in the original San Francisco Bay Shoreline Study (USACE 1988, 1989).

land uses, Mountain View's Shoreline Park, the NASA Ames Research Center, and Sunnyvale Baylands Park; and on the east by Coyote Creek in San Jose and Cushing Parkway in Fremont.

Tributaries. Several tidal sloughs are located within the Alviso pond complex, including Mud Slough, Coyote Creek, Artesian Slough, Alviso Slough, Guadalupe Slough, Whisman Slough, Mountain View Slough, and Charleston Slough (see Figure 3.2-1). The tidal range within these sloughs is relatively large.

The largest tributary in the Alviso pond complex is Coyote Creek, which drains an area of 322 square miles towards the South Bay and conveys a substantial amount of fresh water during winter and spring. Tributaries that connect to Coyote Creek near the Bay include Laguna Creek, Mud Slough, Lower Penitencia Creek, Fremont Flood Control Channel, Artesian Slough, Alviso Slough, and the Coyote Creek bypass channel. Mud Slough and Artesian Slough connect to Coyote Creek near the Alviso-Island pond cluster (Ponds A19, A20, and A21). Mud Slough has a drainage area of about 29 square miles and receives limited freshwater input from Laguna Creek during all seasons. Artesian Slough receives discharges from the San Jose/Santa Clara Water Pollution Control Plant (WPCP).

The Guadalupe River is the second largest tributary in the Alviso pond complex in terms of drainage area and flow. The Guadalupe River receives runoff from a steep upper watershed and an urbanized lower watershed, with a total area of 170 square miles. In the lower reaches, the Guadalupe River enters the Bay through Alviso Slough. The Guadalupe River discharges to Alviso Slough near the A8 Ponds (Ponds A8 and A8S), which then drain to Coyote Creek and subsequently to the South Bay. The combination of low channel slope, low-flow velocity conditions, and availability of Bay sediments creates a depositional environment in Alviso Slough. In addition, construction of the salt ponds themselves reduced tidal prism and scour related to it in Alviso Slough. Following implementation of the Phase 1 actions, which made Pond A6 fully tidal and the A8 Ponds muted tidal, tidal flux in the slough has increased and so has its channel capacity. Channel capacity is maintained annually by the Santa Clara Valley Water District (SCVWD).

Guadalupe Slough drains an 85-square-mile watershed. Historically, the Guadalupe River drained through Guadalupe Slough to the Bay. However, the river was diverted to Alviso Slough in the early 1900s during construction of the salt ponds. Presently, Guadalupe Slough conveys flow from San Tomas Aquino Creek, Calabazas Creek, Sunnyvale East and West Channels, and pumped flow from the independent storm-drainage systems of the City of Sunnyvale (the Sunnyvale Stormwater Pump Station that pumps into Calabazas Creek, the Lockheed Stormwater Pump Station that pumps into Moffett Channel, and a small pump station operated by the Twin Creeks Sports Complex that pumps into the Sunnyvale East Channel). The Sunnyvale WPCP also discharges into Moffett Channel, which connects to Guadalupe Slough. The WPCP provides the primary source of fresh water during the summer and fall.

Tidal sloughs located near the Mountain View Ponds include Whisman Slough, Mountain View Slough, and Charleston Slough. These sloughs are relatively shallow and narrow, with limited freshwater inflows and small drainage areas. Stevens Creek discharges to Whisman Slough. Stevens Creek flows northerly from Mountain View and drains an area of 27 square miles. Much of the creek downstream of State Route (SR) 237 is channelized and armored for bank stabilization and flood protection (PWA et al. 2005b).

Permanente Creek, which discharges to Mountain View Slough, encompasses 28 square miles and includes portions of the cities of Los Altos, Mountain View, Cupertino, and Los Altos Hills.

San Francisquito Creek and Matadero Creek are located between the Alviso and Ravenswood pond complexes on the west side of the Bay. The far South Bay also receives water from the Palo Alto

Regional Water Quality Control Plant, which discharges water between the Ravenswood and Alviso pond complexes.

Sediment Characteristics. The sediment historically deposited within the Alviso pond complex is a mix of sand, silt, and clay. These grain-size distributions also show a marked difference from sloughs, where channels are composed primarily of silt. Sedimentation rates near the Alviso pond complex are generally higher than those near the Ravenswood pond complex due to higher levels of suspended sediment (sediment availability). In the Guadalupe River, SSC measurements indicate that SSCs are strongly correlated with flow rates, with higher SSCs found during times of higher flow. The rate of sedimentation in natural and restored marshes depends on the initial bed elevation, sediment supply in the water column, settling velocities, and the period of marsh inundation. Rates of sedimentation decrease over time as mudflats and marsh plains accrete and tidal inundation decreases. Work by Callaway et al. (2013) at has demonstrated this pattern of relatively rapid sediment accretion immediately following pond breaching, followed by a gradual decrease in accretion rates Ponds A6 and A21. The same report also concluded that the more subsided the ponds were initially, the greater the initial rate of accretion.

Flood Hazards. The 1988 San Francisco Bay Shoreline Study: Southern Alameda and Santa Clara Counties, interim (1998 Shoreline Study) (USACE 1988) determined that tidal flooding is a hazard in Alviso and its surrounding areas due to the potential for overtopping of the outboard pond levees near Alviso Slough and lower Coyote Creek (downstream of Artesian Slough). For the 100-year event, the 1988 Shoreline Study estimated that Alviso could incur up to 6 feet of flooding and that most of the flooding would be limited to the area north of SR 237. Tidal flooding also could occur at the Sunnyvale sewage treatment ponds, the northern portion of the NASA Ames Research Center, Moffett Federal Airfield, the Lockheed Missiles and Space Company Plant, and the industrial park area north of Java Drive and west of the Sunnyvale East Channel under extreme tide and wind conditions (USACE 1988).

FEMA has also published flood study results for the tributaries to the Alviso pond complex in community-specific flood insurance studies. These studies provide fluvial flood event discharges for various recurrence intervals. However, the FEMA discharge values may underestimate peak flows, which are now contained within the channel due to recent flood-protection projects.

Flooding due to overflow from the Guadalupe River, Alviso Slough, and Coyote Creek historically represents the most significant flood hazard to San Jose and the community of Alviso within it. Major flood-protection projects (such as the Lower Guadalupe River Flood Protection Project, discussed below in the project setting for the A8 Ponds) have been completed to reduce flood risk. Improvements include channel modifications, bank stabilization, and new levees. However, inadequate drainage in zones of low elevation remains a local problem.

Permanente Creek had a history of recurring floods in Los Altos and Mountain View. In response to these floods, SCVWD and other agencies have improved several sections of the creek. Improvements include channel lining and construction of the Permanente Diversion, as well as erosion control, structural repair, sediment reduction, and habitat restoration. SCVWD has begun work on additional projects to increase channel capacity in Permanente Creek.

Ravenswood Pond Complex

The Ravenswood pond complex (formerly the West Bay Complex) consists of seven ponds in San Mateo County. The pond complex covers 1,600 acres and is owned and operated by the USFWS. The pond complex is located on the bayside of the San Francisco Peninsula, both north and south of SR 84 west of the Dumbarton Bridge, and on the bayside of the developed areas of Menlo Park. Bayfront Park in Menlo Park is directly west of the pond complex, and a portion of SR 84 and the Dumbarton rail corridor are along its southern border.

Tributaries. Tidal sloughs near the Ravenswood pond complex include Ravenswood Slough and Flood Slough. Ravenswood Slough is located on the north-east border of the Ravenswood pond cluster (Ponds R3, R4, R5, and S5). Relatively little freshwater input is discharged from Ravenswood Slough into the Bay. Flood Slough is located west of the ponds. Flood Slough drains to the Bay through Westpoint Slough.

No major drainages flow directly to the Ravenswood pond complex, but sloughs receives local runoff from the adjacent areas. Local upstream drainage from portions of Redwood City, Menlo Park, Atherton, and unincorporated San Mateo County is generally conveyed to the Bayfront Canal, which outfalls to Flood Slough.

Sediment Characteristics. Because tributaries to the Ravenswood Slough discharge very little fresh water to the slough, sediments within the Ravenswood Slough and adjacent ponds originate primarily from the Bay and are sandier than those within the Alviso pond complex. Sediment deposition rates in marsh restoration areas near the Ravenswood pond complex are consistent with the regional sediment transport and availability patterns (PWA et al. 2005a).

Flood Hazards. Flooding near the Ravenswood pond complex occurs when large storms coincide with high tides resulting in broad shallow street flooding and local ponding. Fluvial flooding in the Ravenswood region is largely due the inability of local drainage runoff to reach the Bay. Flows are restricted as a result of insufficient channel capacity along the Bayfront Canal and Atherton Channel. The salt pond perimeter levee may also be overtopped at extreme high tides, adding to the potential flood risks. Existing levees do not meet FEMA standards for flood protection and therefore, major urban areas are included in the tidal flood zone, including the Bohannon Industrial Park between SR 84 and U.S. Highway 101 and the Belle Haven neighborhood in Menlo Park. USACE currently has no coastal flood limit delineated for the Ravenswood pond complex. However, the entire area and inland areas are within the FEMA floodplain based on projections of the 100-year still water elevation.

The San Francisquito Creek Joint Powers Authority has initiated design, alignment selection, planning, and environmental planning on the Strategy to Advance Flood Protection, Ecosystems and Recreation along the Bay (SAFER Bay) project to address coastal flooding in the southern portion of San Mateo County. That project’s primary alignment begins just west of Flood Slough and runs along the southern margins of Ponds S5 and R3 and other portions of the Ravenswood pond complex.

3.2.3 Project Setting

This section describes the physical setting of the Phase 2 area. Actions taken under the ISP and Phase 1 of the SBSP Restoration Project are included in the setting for Phase 2 actions.

The SBSP Restoration Project is a program to restore tidal marsh habitat, reconfigure managed pond habitat, maintain flood protection, and provide recreation opportunities and public access. The SBSP Restoration Project (described in the 2007 EIS/R) would restore a mosaic of tidal and managed pond habitats over an approximate 15,100-acre footprint within Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). A continuous band of tidal marsh (a “tidal marsh corridor”) along the edge of the Bay would provide connectivity of habitat for tidal marsh-dependent species. Tidal habitats would experience tidal inundation of bay water, and marshes would be created through estuarine sedimentation and natural vegetative colonization. Habitat transition zones would be restored in some areas. Managed ponds would encompass a range of water depths and salinity regimes through the use of flow control structures, grading, and other means. SBSP Restoration Project lands reflect the diversity of wildlife habitats that could be restored to tidal wetlands, brackish marsh, managed ponds, seasonal wetlands, riparian habitat, freshwater marshes and adjacent uplands.

Phase 2 of the SBSP Restoration Project is a direct outgrowth of the acquisition of the Alviso and Ravenswood pond complexes and of the continued implementation of the larger SBSP Restoration Project laid out in the 2007 EIS/R. Phase 2 project actions in the Alviso pond complex focus on three clusters of ponds (see Figure 3.2-1). Ponds A19, A20, and A21, referred to as the Island Ponds, are located between Coyote Creek and Mud Slough near the eastern end of the Alviso pond complex. Ponds A1 and A2W, referred to as the Mountain View Ponds, are on the western edge of the Alviso pond complex. The city of Mountain View lies immediately to the south of these ponds, and the Charleston Slough and the Palo Alto Flood Control Basin lie to the west. Ponds A8 and A8S are located in the southern central portion of the Alviso pond complex. They are west of the town of Alviso and north of Sunnyvale and SR 237. Phase 2 project actions in the Ravenswood pond complex are focused on the pond cluster of Ponds R3, R4, R5, and S5. These ponds are located in San Mateo County on the bayside of the San Francisco Peninsula, north of SR 84 and west of the Dumbarton Bridge.

Alviso-Island Ponds

The Alviso-Island Pond cluster, also referred to as the Island Ponds (Ponds A19, A20, and A21), are located at the southern extent of the Bay near Coyote Creek. The Island Ponds were middle-stage salt evaporator ponds with intermediate salinity levels. The levees surrounding the Island Ponds are outboard salt pond levees.

Tidal inundation was restored at the 475-acre Alviso-Island pond cluster in March 2006 as part of the tidal marsh restoration actions implemented under the ISP. Two breaches were cut in Pond A19, a single breach was cut in Pond A20, and two breaches were cut in Pond A21. The breaches were approximately 30 to 45 feet wide. The excavated breaches in the levees and outboard marshes were designed to have the same invert elevation (2.7 feet North American Vertical Datum of 1988 [NAVD88]). Since the original cuts, the breaches have widened and are now between 30 to 150 feet wide (SCVWD et al. 2010). The Island Ponds have been developing tidal marsh habitat since the ponds were breached. The five breaches cut along the south side of the ponds allow full tidal inundation. This restoration approach is a minimally engineered, passive design that relies on the natural sedimentation processes to restore the ponds to tidal marsh habitat. The overall restoration goal is to successfully reestablish vegetation, promote recolonization by benthic organisms, and provide habitat for various wildlife species.

Because the Island Ponds are subject to tidal inundation, these ponds can fill during flood events with a combination of tidal and fluvial flows. As the ponds fill during incoming tides, the ponds could provide temporary flood storage for Coyote Creek flows and may provide temporary relief to upstream flood-control facilities. (Flood-control facilities in the lower 7 miles of Coyote Creek include levee setbacks and overflow channels.) However, as the ponds drain during outgoing tides, water leaving the ponds would occupy the main channel, which would otherwise be used to convey flood flows. This could delay fluvial flood flows and prolong flooding in upstream areas.

Alviso-Mountain View Ponds

The Alviso-Mountain View pond cluster includes Pond A1, Pond A2W, and Charleston Slough. The pond cluster is located in the western portion of the Alviso pond complex. It is bracketed by Stevens Creek on the east and Charleston Slough on the west. Ponds A1 and A2W are separated by Mountain View Slough. Perimeter outboard salt pond levees, publicly maintained flood-control levees, and/or high ground surround Ponds A1 and A2W.

The Mountain View Ponds are currently operated for limited tidal circulation through Ponds A1 and A2W while maintaining discharge salinities to the Bay at less than 40 ppt (see Figure 3.2-3). The intake for the Mountain View Ponds' system is located at the northwest end of Pond A1 and includes one 48-inch gate from lower Charleston Slough near the Bay. Flow moves through the system from the intake at Pond A1 though the 72-inch siphon under Mountain View Slough to Pond A2W. The system outlet is located at the north end of Pond A2W, with one 48-inch gate to the Bay. The gates are iteratively adjusted as needed to find the correct equilibrium of water inflow and discharge to account for evaporation and salinity concentration during the summer. Operations of the Mountain View Ponds' system require little active management of gate openings to maintain appropriate flows. However, flows can be modified based on changes in dissolved oxygen levels.

The existing outboard salt pond levees at Ponds A1 and A2W provide some measure of flood protection to inland areas. As waves break against the outboard levees, the levees are overtopped, and the ponds fill during coastal flooding conditions. The landward sides of Ponds A1 and A2W are high ground atop the closed landfill under Shoreline Park. The levee to the west of Charleston Slough protects the Palo Alto Flood Basin. The southwestern corner of Charleston Slough has a relatively unprotected area between the high ground of Shoreline Park and the levee between the Palo Alto Flood Basin and Charleston Slough. This low-lying area includes the Coast Casey Forebay (a detention basin for runoff) and the similarly named levee separating the forebay from Charleston Slough.

Alviso-A8 Ponds

The Alviso-A8 pond cluster (also referred to as the A8 Ponds) is located within the Alviso pond complex between Alviso and Guadalupe Sloughs in the South Bay. Pond A8 was historically part of a larger tidal marsh that was diked in the mid-1900s for salt production. Perimeter levees separate the pond from Alviso Slough to the northeast and Guadalupe Slough to the southwest. Internal levees formerly separated Pond A8 from adjacent Ponds A5 and A7, and they also separate Pond A8 from Pond A8S. Portions of these internal levees still remain, many of which had levee roads on them, and there are pieces of concrete rubble and other roadbed materials left in place. Deeper borrow ditches surround the ponds along the inboard side of the levees (USFWS and USGS 2012).

During Phase 1 of the SBSP Restoration Project, levees were breached between Pond A8 and Ponds A8S, A5, and A7, and a reversible armored notch was installed (see Figure 3.2-4). The reversible notch was installed in the eastern levee to allow muted tidal exchange. The notch may be opened to various widths or closed as needed for water quality or fish migration purposes. Notch operations are anticipated to naturally widen and deepen Alviso Slough over a period of years through tidally induced scour, thus increasing the flow conveyance of Alviso Slough.

URS Oakland CA 4/29/2015 USER Alexis_Buchwald PATH L:\Projects\South_Bay_Salt_Ponds\Maps\Hydrology_WaterQuality\Figure 3.2-3.mxd

LEGEND

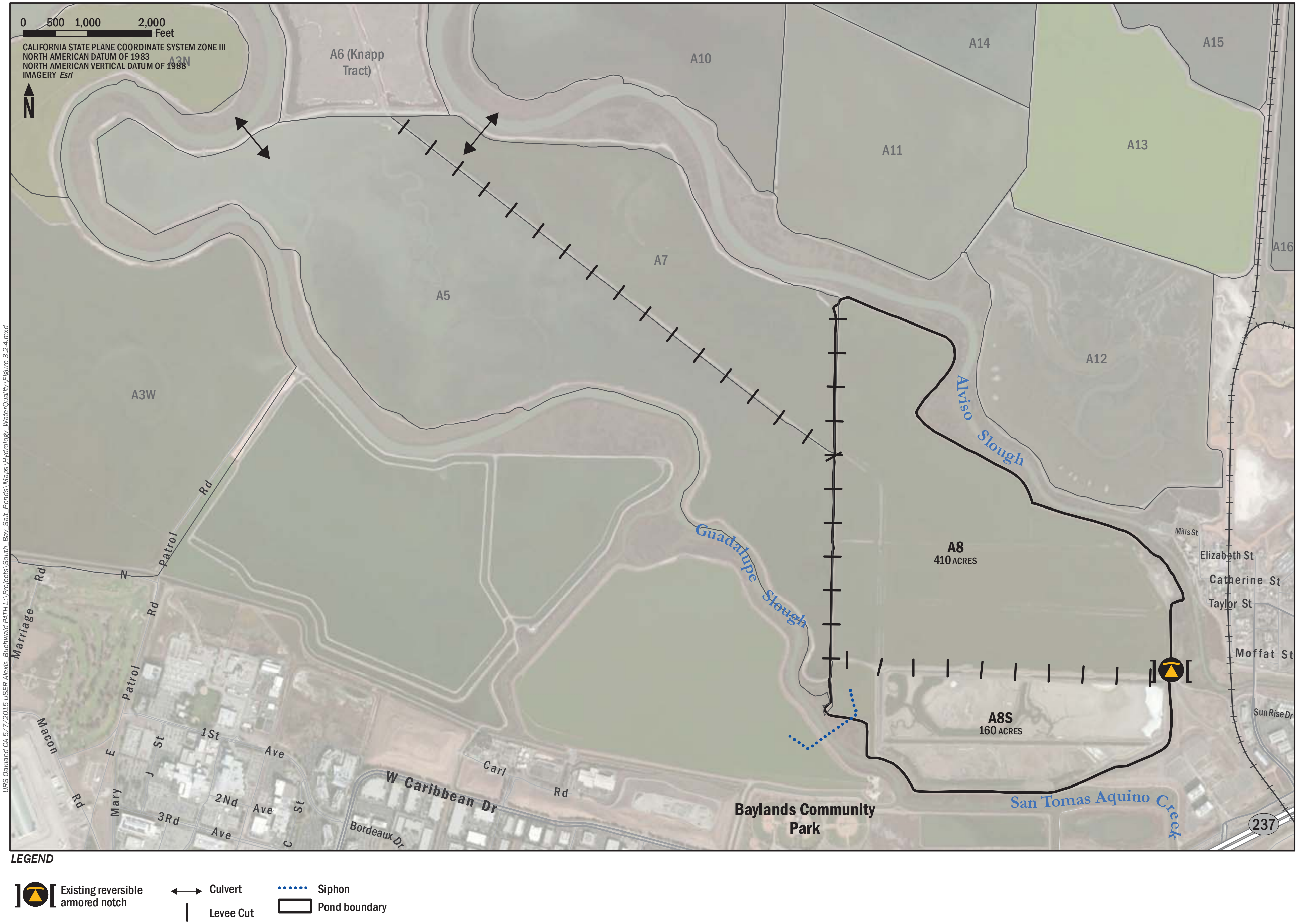
Existing control gate

Siphon

Pond boundary

URS
South Bay Salt Pond Restoration Project

Figure 3.2-3
Existing Circulation in the Mountain View Ponds



URS
South Bay Salt Pond Restoration Project

Figure 3.2-4
Existing Circulation in the A8 Ponds

As part of the Lower Guadalupe River Flood Protection Project, SCVWD constructed a series of floodwalls and levees along Guadalupe River and Alviso Slough. The west levee of Alviso Slough was reconfigured to act as a weir, allowing high flows in the Guadalupe River to exit Alviso Slough and enter Pond A8. The reconfigured west bank can divert up to 8,500 cfs to Pond A8 (of the 100-year flow, estimated at 18,300 cfs) and decrease water surface elevations in Alviso Slough downstream of the Union Pacific Railroad (UPRR). Flood flows would be conveyed into Ponds A5, A6, and A7. Flood waters would be held in the Pond A8 system and then pumped out (or conveyed via culverts with flap gates) over a period of time (about 1 month).

Existing Levees. Perimeter levees were originally constructed to protect Pond A8 from fluvial flooding, and therefore crest elevations are on average 12.3 feet NAVD88 (i.e., 4.8 feet above MHHW and 1.3 feet above the 100-year water level), except at the location of the engineered weir. The 1,000-foot-long overflow weir at Pond A8 allows high flood flows to exit Alviso Slough when water levels reach approximately 10.5 feet NAVD88. Due to the relatively low elevation of interior pond levees, flood water stored in Pond A8 would spill into Pond A8S (at 2.5 feet NAVD88), Pond A5 (at 3.25 feet NAVD88), Pond A7 (4.0 feet NAVD88), and eventually Pond A6 (at 10.0 feet NAVD88) (USFWS and USGS 2012).

Residual internal salt pond berms break up the topography of the A8 Ponds. Historic tidal marsh channels remain within the interior of Pond A8S (demarcated by the meandering shallow depressions that are visible on imagery taken during periods when the pond was dry), even though the entire bed has subsided. Borrow ditches were excavated along the entire perimeter of the pond and adjacent to the internal berms to obtain fill material for levee construction and maintenance. The depths of the borrow ditches are approximately 9 feet below the pond bed.

Existing Operations. As part of the Phase 1 actions, the Pond A8 system is operated to maintain muted tidal circulation through Ponds A5, A7, A8 and A8S, while maintaining discharge salinities to the Bay at less than 40 ppt. Phase 1 project actions allow for approximately 400 acres of muted tidal habitat in Pond 8 and approximately 1,000 additional acres of shallow water habitat with modified water depths in Ponds A5 and A7. Restoration of tidal action at Pond A8 was designed to be adaptable and reversible so that in the event that unacceptable environmental impacts begin to occur, tidal exchange to Pond A8 can be modified or eliminated to prevent long-term adverse impacts.

The Pond A8 system consists of a variety of elements that allow for a muted tidal connection from the adjacent slough to the A8 Ponds. Existing structures at the A8 Ponds include an armored notch between Pond A8 and upper Alviso Slough. Water exchange through the armored notch is limited, and the tidal range within the ponds is muted. With a fully open notch, water level fluctuations over a tidal cycle in the ponds are small (0.5 foot to 1 feet) compared to the range of tidal change in Alviso Slough (over 8 feet).

Ravenswood Ponds

The Phase 2 Ravenswood Ponds (Ponds R3, R4, R5, and S5) are operated as seasonal ponds. Seasonal ponds are passively managed as seasonal wetlands that receive direct precipitation, groundwater inflows, and minimal overland runoff during the wet season. During the dry season, seasonal ponds are allowed to dry out by seepage and evaporation. There is no gated or culverted hydraulic connection between the ponds that is actively managed or used. Operation or maintenance activities include inspection of berms and bird monitoring.

The outboard salt pond levees at Ponds R3 and R4 provide some flood protection to inland areas. As waves break against the bayward-facing levees, the levees are overtopped and the ponds fill. The ponds provide storage and dissipate wave energy.

Local flooding can occur in the neighborhoods behind Redwood City's Bayfront Canal and Menlo Park's Atherton Channel when large stormwater outflows coincide with high tides in Flood Slough. The Bayfront Canal is the stormwater transmission canal for Atherton Channel that discharges through Flood Slough and into the Bay. During storms that coincide with high tides, Bayfront Canal and Atherton Channel cannot discharge sufficient stormwater flows to the Bay, and depending on the intensity of the storm, Bayfront Canal and Atherton Channel do not have enough detention capacity to prevent flooding in low-lying areas.

3.2.4 Regulatory Setting

This section provides a description of the implementing agencies involved in flood management in the Phase 2 area and a brief summary of the regulatory setting: the primary laws and regulations related to flood management, hydrodynamics, and sediment transport in the region.

3.2.5 Flood Management Implementing Agencies

Flood risk assessments and some flood-protection projects are conducted by federal agencies, including FEMA and USACE. The flood management agencies and cities implement the National Flood Insurance Program under the jurisdiction of FEMA and its Flood Insurance Administration. The FEMA-designated flood risk assigned to geographic areas along the Bay is illustrated on FIRMs. FEMA FIRMs show base flood elevations (which include predicted water surface elevations landward of shoreline and river barrier crests for the design event) and special flood hazard zones.

USACE also conducts studies on flood hazards and participates in flood management projects in which they have regulatory jurisdiction, as stated in Section 10 of the Rivers and Harbors Appropriation Act (RHA) of 1899 (often simply referred to as the Rivers and Harbors Act). All significant USACE construction projects are subject to authorization by Congress pursuant to the Water Resources Development Act. Additionally, USACE is given authority to pursue projects in which Congress has determined a federal interest in joint flood protection / ecosystem restoration (Executive Order 11988). USACE has developed principles and guidelines for designing and constructing flood-protection measures for coastal, estuarine, and river environments. USACE also has previously conducted studies on flood hazards and risks as part of the original San Francisco Bay Shoreline Study (USACE 1988, 1989, 1992).

Other agencies responsible for flood management include the local flood control districts and city public works departments. The local flood control districts have local jurisdiction for the development of flood-protection projects. The flood control districts' authority is derived from enabling legislation passed by the State of California. In the area of the SBSP Restoration Project, the relevant flood control districts include SCVWD for the Alviso pond complex and the County of San Mateo Public Works Department for the Ravenswood pond complex. SCVWD is a special district that oversees flood protection and watershed management in Santa Clara County, but is not part of the county government. Local flood control districts are responsible for providing flood protection to the counties and cities in their jurisdiction and are the issuing agency for encroachment permits for storm drain outfalls into flood- protection channels.

3.2.6 Laws and Regulations

The SBSP Restoration Project falls under the jurisdiction of many federal, state, and local agencies with respect to specific aspects of planning, restoration, and management. The following section summarizes the primary laws and regulations affecting flood management, hydrodynamics, and sediment transport within the Phase 2 area.

Federal Regulations

Federal Clean Water Act. Section 404 of the Clean Water Act (CWA) regulates all activities resulting in the discharge of dredged or fill material into waters of the United States, which includes wetlands. Section 404 gives USACE the principal authority to regulate discharges of dredged or fill material, under oversight by the United States Environmental Protection Agency (USEPA). While USACE is given authority to issue permits allowing such discharges, the USEPA is given the authority to veto permit decisions.

Rivers and Harbors Act. The RHA prohibits the unauthorized alternation or obstruction of any navigable waters of the United States. As defined by the RHA, navigable waters include all waters that are:

- Historically, presently, or potentially used for interstate or foreign commerce; and
- Subject to the ebb and flow of tides.

Regulations implementing Section 10 of the RHA are coordinated with regulations implementing CWA Section 404. The RHA specifically regulates:

- Construction of structures in, under, or over navigable waters;
- Deposition or excavation of material in navigable waters; and
- All work affecting the location, condition, course, or capacity of navigable waters.

The RHA is administered by USACE. If a proposed activity falls under the authority of RHA Section 10 and CWA Section 404, USACE processes and issues a single permit. For activities regulated only under RHA Section 10, such as installation of a structure not requiring fill, permit conditions that protect water quality during construction may be identified in a letter of permission. A letter of permission is a type of individual permit issued by USACE, through an abbreviated processing procedure, for certain activities subject to RHA Section 10.

Coastal Zone Management Act. The Coastal Zone Management Act of 1972 requires that federal actions be consistent with state coastal plans. The San Francisco Bay Conservation and Development Commission (BCDC) Bay Plan is approved under the Coastal Zone Management Act. To implement this provision, federal agencies make “consistency determinations” on their proposed activities, and applicants for federal permits, licenses, other authorization, or federal financial assistance make “consistency certifications.” BCDC then has the opportunity to review the consistency determinations and certifications and to either concur with them or object to them.

Executive Order 11988–Floodplain Management. Executive Order 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. Under this order, USACE is required to take action and provide leadership to:

- Avoid development in the base floodplain;
- Reduce the risk and hazard associated with floods;
- Minimize the impact of floods on human health, welfare, and safety; and
- Restore and preserve the beneficial and natural values of the base floodplain.

National Flood Insurance Acts. The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were enacted to reduce the need for flood-protection structures and to limit disaster-relief costs by restricting development on floodplains. FEMA was created in 1979 to administer the National Flood Insurance Program and to develop standards for fluvial and coastal floodplain delineation.

State Regulations

McAteer-Petris Act. The McAteer-Petris Act of 1965 established the BCDC as a temporary state agency in charge of preparing the Bay Plan. In 1969, the Act was amended to make the BCDC a permanent agency and to incorporate the policies of the Bay Plan into state law. Under the McAteer-Petris Act and the Bay Plan, any agency or individual proposing to place fill in, to extract materials from, or to substantially change the use of any water, land, or structure in BCDC‘s jurisdiction is required to secure a San Francisco Bay Permit. BCDC grants San Francisco Bay permits for projects that meet either of the following guidelines:

- The project is necessary to the safety, welfare, or health of the public in the entire Bay Area; or
- The project is consistent with the provisions of the implementing regulations and the Bay Plan.

The types of San Francisco Bay permits include region-wide, administrative, and major permits. The type of permit issued depends on the nature and scope of the proposed activities.

California Water Code. The California Water Code ensures that the water resources of California are put to beneficial use to the fullest extent of which they are capable and that the conservation of water is exercised in the interest of the people and for the public’s welfare. All projects in California must abide by Division 5 of the State of California Water Code, which sets the provisions for flood control. The State of California Water Code includes a number of provisions that pertain to local and state flood management and flood protection. Section 8100 et seq. of the Code contains guidelines for the construction of public works and improvements, including the protection and restoration of watersheds, levees or check dams to prevent overflow or flooding, conservation of the floodwaters, and the effects of construction projects on adjacent counties (especially upstream and downstream along a river). Section 12840 et seq. of the Code contains provisions related to flood-prevention projects.

California Fish and Game Code Sections 1600 to 16016. In accordance with Sections 1601 to 1607 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates projects that affect the channel, flow, or banks of rivers, lakes, or streams. Sections 1602 and 1603 require public agencies and private individuals to notify and enter into a streambed or lake alteration agreement with the CDFW before beginning construction that would:

- Change, divert, or obstruct the natural flow or the bed, bank, or channel of any river, lake, or stream;

- Use materials from a streambed; or
- Result in the deposition or disposal of debris, waste, or other material containing flaked, crumbled, or ground pavement where it can pass into any river, lake, or stream. Lake or streambed alteration agreements may impose conditions to protect water quality during construction.

Sections 1600 to 1616 may apply to any work undertaken within the 100-year floodplain of a body of water or its tributaries, including intermittent stream channels. In general, these sections are construed as applying to work within the active floodplain and/or associated riparian habitat of a stream, wash, or lake that provides benefits to wildlife and fish. Sections 1600 to 1616 typically do not apply to drainages that lack defined beds and banks, such as swales, or to very small bodies of water and wetlands.

Local Regulations

Santa Clara Valley Water District Act. The Santa Clara Valley Water District Act of 1951 established SCVWD, giving it the authority to implement the following SCVWD purposes identified by the Act:

- To protect Santa Clara County from flood and stormwater;
- To provide comprehensive conservation and management of flood, storm, and recycled waters for all beneficial uses;
- To increase and prevent the waste of the water supply in the District; and
- To enhance, protect, and restore stream, riparian corridors, and natural resources in connection with other purposes of water supply and flood protection.

Under the Water Resources Protection Ordinance (Ordinance 06-1), the SCVWD requires encroachment permits for modifications on SCVWD facilities and/or SCVWD easements. Activities requiring a permit include: grading, removing, dredging, mining, or extraction of any materials; constructions, reconstruction, demolition or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or installation of vegetation. Permits, if granted, may require mitigation for any disturbance to the health of the watercourse.

San Mateo County Flood Control District Act. The San Mateo County Flood Control District Act of 1959 establishes the San Mateo County Flood Control District (SMCFCD) in order to:

- Control and conserve stormwater and flood waters;
- Prevent waste or exportation of water;
- Retain drainage, storm, flood and other waters for beneficial use in the district; and
- Prevent pollution or diminution of water supply.

The SMCFCD is a special district created by the state legislature. While the SMCFCD has jurisdiction throughout all of San Mateo County, the cities within San Mateo County are not prohibited from undertaking flood control projects and regulating activities in the floodplain within their respective communities.

3.2.7 Environmental Impacts and Mitigation Measures Overview

This section describes environmental impacts and mitigation measures related to hydrology, flood management, and infrastructure. It includes a discussion of the criteria used to determine the significance of impacts. Potential impacts were characterized by evaluating direct, indirect, short-term (temporary), and long-term effects. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.2.2 above, and not the proposed conditions that would occur under the No Action Alternative. This approach is consistent with the California Environmental Quality Act (CEQA), which requires that project impacts be evaluated against existing conditions. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other Refuge management documents and practices.

3.2.8 Significance Criteria

Hydrology and flood risk were assessed by comparing expected conditions in the future under each alternative against the baseline conditions. For the purposes of this Final EIS/R, the project is considered to have adverse impacts on hydrology or flooding if it would:

- Increase the risk of flooding that could cause injury, death, or substantial property loss;
- Alter existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site;
- Create a safety hazard for people boating in the project area;
- Result in inundation by a seiche, tsunami, or mudflow;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems; or
- Place structures within the 100-year-flood hazard area that would impede or redirect flood flows.

The SBSP Restoration Project, Phase 2 alternatives would not create or contribute runoff or place structures in flood hazard areas that would impede flood flows. These criteria are intended for evaluation of urban land uses and do not apply to the proposed project's Phase 2 actions.

As explained in Section 3.1.2, while both Council on Environmental Quality (CEQ) Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts. For the purpose of this National Environmental Policy Act (NEPA)/CEQA impact assessment, the thresholds of significance are applied to changes from baseline conditions that result from factors within the control of the project proponents.

3.2.9 Program-Level Evaluation Summary

Three programmatic-level alternatives were considered and evaluated in the 2007 EIS/R. This included (A) the No Action Alternative, (B) the Managed Pond Emphasis, and (C) the Tidal Habitat Emphasis. At the program level, the decision was made to select Alternative C and implement Phase 1 actions.

Therefore, a summary of the impacts for Programmatic Alternative C from the 2007 EIS/R are provided below.

The determination was made in the 2007 EIS/R that Alternative C would result in less than significant impacts for the following:

- Coastal flood risk landward of the area of the SBSP Restoration Project;
- Fluvial flood risk;
- Levee erosion along channel banks downstream of tidal breaches; and
- Potential interference with navigation.

Impacts from coastal flood risk due to regional changes in Bay bathymetry and hydrodynamics were considered potentially significant.

Under Alternative C, implementation of the AMP would maintain or improve levels of coastal and fluvial flood protection landward of the area of the SBSP Restoration Project. For example, salt pond levees would be inspected and regularly maintained and levees would be improved (e.g., raise, widen, or armor the levee) as needed, in accordance with the AMP. Alternative C would also be designed such that levees downstream of breaches are either no longer required for flood protection, are adequately maintained, or are protected from erosion (e.g., by a band of marsh between the levee and the channel, setting the levee back from the eroding channel, or by armoring the levee). Therefore, the widening and deepening of sloughs would not substantially affect downstream flood control projects.

3.2.10 Project-Level Evaluation

Phase 2 Impact 3.2-1: Increased risk of flooding that could cause injury, death, or substantial property loss.

Alviso-Island Ponds

Alternative Island A (No Action). No new activities would occur under Phase 2 and the pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The existing breached levees would continue to scour from hydraulic action and naturally degrade. Ongoing monitoring and studies to track the progress of these ponds toward tidal marsh restoration would be the principal component of the continued implementation of the AMP.

Under the No Action scenario, tidal inundation would cause existing breaches to widen and adjacent levee areas to continue to scour until equilibrium conditions are met. Over a 50-year horizon, tidally restored ponds are expected to develop into mature salt marsh. Sedimentation would raise pond-bottom elevations above vegetation-colonization elevations; vegetation would establish; and marsh channels would develop within the restored marsh. Mature salt marsh typically exists within the South Bay at an elevation near MHHW, so bottom elevations are assumed to eventually rise to this level. Because the Island Ponds are breached to tidal action, flow in adjacent sloughs has increased. Tidal scour would widen and deepen adjacent sloughs until equilibrium conditions are met. A possible exception is Coyote Creek, which may already be oversized and accreting sediment (see Appendix J of the 2007 EIS/R).

Although Ponds A19, A20, and A21 are surrounded by outboard salt pond levees, these levees would not provide coastal flood protection to landward areas from high water levels because the Island Ponds have full tidal inundation and because an existing wetland that connects to both Coyote Creek and Mud Slough is landward of the Island Ponds. Bayward levees may provide some level of protection from wave action because waves would break against these levees. Further unintentional breaching of these levees may cause waves to propagate into the ponds but would not change coastal flood conditions.

The ponds contribute to tidal flow in Coyote Creek as they drain. This could cause short-term effects on upstream fluvial flood conditions if the flow in the creek channel is constrained. However, Coyote Creek appears to be oversized relative to existing outflows and therefore any effects on fluvial flood conditions would likely be minimal. Furthermore, long-term marsh development within the ponds would decrease the tidal prism, potentially alleviating increased fluvial flood risk from the creek.

3.2.11 Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, Pond A19 would be breached to Mud Slough on the north side. Alternative Island B would also remove or lower the levees between Ponds A19 and A20 to support hydraulic connectivity, alter circulation and sedimentation patterns, and thus increase habitat complexity in Ponds A19 and A20. Any levee material that is moved would be used locally to fill borrow ditches and further speed revegetation. Increases in sediment accumulation and/or sediment distribution in the ponds could help achieve a future flood-protection goal of ensuring that the rate of sediment accretion and marsh development keeps pace with expected future sea-level rise.

Phase 2 actions would not change the total volume of water that fills and drains from the ponds immediately after construction activities. Because there would be new breaches to Mud Slough, tidal flow within Coyote Creek would decrease, and tidal flow within Mud Slough would increase. Tidal scour would likely widen and deepen Mud Slough until equilibrium conditions are met.

The Island Ponds do not and would not provide coastal flood protection to landward areas from high water levels because the Island Ponds are fully tidal and are surrounded by water on all sides. Bayward levees may provide some level of protection from wave action because waves would break against the levees. Lowering the levees on Pond A19 may allow waves to propagate into the pond, but these waves would dissipate or break on the inside levee. If the east side of the levee is overtopped, water that would enter into the adjacent wetland would have reduced energy and would spill into a brackish restoration area behind it.

Water from Ponds A19 and A20 would contribute to increased tidal flows in Mud Slough. Water that drains from the ponds into Mud Slough on the ebb tide could delay fluvial flood flows in Mud Slough from reaching the Bay. If flow in the channel is constrained, this could cause short-term effects on upstream fluvial flood conditions. However, breaching Pond A19 to Mud Slough would improve hydraulic connectivity and cause tidal scouring within the channel. This would improve tidal drainage and provide additional fluvial discharge capacity. Therefore, effects to upstream fluvial flood conditions are expected to be minimal.

Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended. Changes to coastal and fluvial flood risk would be minimal for the above-mentioned reasons, and therefore impacts would be less than significant.

3.2.12 Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would include all of the components of Alternative Island B with the addition of levee breaches to Mud Slough on the north side of Ponds A20 and A21, pilot channels in Pond A19, and widened breaches on the southern levee of Pond A19. These additional components are intended to add additional habitat complexity and complexity in and between all of the ponds and their surrounding waterways. Any levee material that is moved would be used locally to fill borrow ditches and further speed revegetation. Increases in sediment accumulation and/or sediment distribution in the ponds would also help achieve a future flood-protection goal of ensuring that the rate of sediment accretion and marsh development keeps pace with expected future sea-level rise.

Phase 2 improvements would affect coastal and fluvial flooding in a similar manner as improvements under Alternative Island B. The Island Ponds would not provide coastal flood protection to landward areas from high water levels but would continue to provide some level of protection from waves. Tidal flow in Mud Slough would increase, and tidal flow in Coyote Creek would decrease. Breaching the Island Ponds to Mud Slough would improve hydraulic connectivity and cause tidal scouring within Mud Slough. This would improve tidal drainage and provide additional fluvial discharge capacity.

Monitoring and adaptive management would be used to verify that Phase 2 actions are performing as intended. Changes to coastal and fluvial flood risk would be minimal for the above-mentioned reasons, and therefore impacts on coastal and fluvial flooding would be less than significant.

3.2.13 Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (No Action), no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System in accordance with the AMP and other Refuge management documents and practices. The pond cluster would continue to be managed through the activities described in the AMP, in accordance with current USFWS practices. The ponds would not be actively managed except for the current water-quality management, which involves circulating water as needed to control dissolved oxygen per the AMP. The current use of water in Charleston Slough to supply the Shoreline Park sailing lake’s water system would also continue.

The levees around Ponds A1 and A2W are high-priority levees that are to be maintained for inland flood protection. These levees would be maintained (or repaired upon unexpected failure). Areas immediately south of the ponds are high ground atop the closed landfill under Shoreline Park. The levee to the west of Charleston Slough protects the Palo Alto Flood Basin. The southwestern corner of Charleston Slough has a relatively unprotected low-lying area between the high ground of Shoreline Park and levee between the Palo Alto Flood Basin and Charleston Slough. That area would be subject to tidal inundation if the levee between A1 and Charleston Slough were to be overtopped.

Under the No Action scenario, it is assumed that unanticipated breaches in the Mountain View Ponds would be repaired, so as to maintain current levels of flood protection. Therefore effects to coastal and fluvial flood risk would be minimal, and impacts would be less than significant.

3.2.14 Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would increase tidal flows in Ponds A1 and A2W by breaching levees at several points (e.g., the northwest corner of Pond A1 would be breached to Charleston Slough, and Pond A2W would be breached at two locations to Mountain View Slough on the west and at two locations to Whisman Slough on the east). The breaches to Whisman Slough would be armored and bridged to allow bayward access along that levee by Pacific Gas and Electric Company (PG&E) for tower and power-line maintenance. Habitat transition zones and islands would be constructed to increase habitat complexity. The west levee at Pond A1 would be raised to provide additional flood-control protection.

The Mountain View Ponds are currently operated for very limited tidal circulation through Ponds A1 and A2W. Bay-facing levees would continue to provide some level of coastal flood protection from wave action as waves break against the levees. Levee breaches would allow full tidal inundation to the ponds, and the internal side of the salt pond levees would be subject to tidal flows. Existing flood control levees would also be breached. These actions would reduce the level of flood protection provided by these levees. However, the levee along the west side of Pond A1 would be raised such that the current level of flood protection would be maintained or exceeded by preventing tidal flows from Pond A1 from entering Charleston Slough and affecting currently low and unprotected areas at its southern end. Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended.

Therefore, impacts to flood protection would be less than significant.

3.2.15 Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Pond A1 would be breached at three locations, Pond A2W would be breached at four locations, and the existing levee across Charleston Slough would also be breached or have its tide gate removed. The southern and western levees of Charleston Slough would be raised. Habitat transition zones and islands would be introduced to increase habitat complexity.

Similar to the effects described above for Alternative Mountain View B, these Phase 2 actions would reduce the level of flood protection provided by Pond A1 and A2 levees. However, flood-control functions would be maintained and even increased with improvements to the western and southern levees around Charleston Slough. The flood-control functions would be increased relative to the baseline because the City of Mountain View (a project partner if Alternative C is selected) would assist in raising and improving the levees bordering Charleston Slough to levels beyond that required of the SBSP Restoration Project. Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended. Therefore, impacts would be less than significant and would be beneficial under NEPA.

3.2.16 Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (No Action), the USFWS would continue to operate and maintain the A8 Ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These management practices include inspections of pond infrastructure to ensure the pond is operating as intended and water quality requirements are being met, monitoring of restoration performance, summer water-level recording; and management of tidal exchange between Pond A8 and Alviso Slough during the wet season to avoid fish trapping and to maintain existing levels of flood protection. Because existing levels of flood protection would be maintained and adaptive management would be used to actively monitor and assess flood-protection measures, impacts to flood protection would be less than significant.

3.2.17 Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. In this alternative, habitat transition zones would be constructed in the southwest and southeast corners of Pond A8S. As in the Mountain View Ponds, the habitat transition zones would perform several functions: they would add some flood protection, buffer against sea-level rise, add transitional habitat, and protect the adjacent landfill. The habitat transition zones would be constructed of dredged material and/or upland fill material and would extend into the center of the pond at a slope of 30:1 or steeper.

Phase 2 actions would not change water levels in the A8 Ponds or interfere with flood-control functions. The habitat transition zones would consume some of the capacity of Pond A8S, which could provide temporary detention for high flood flows from Alviso Slough. However, internal levees at Ponds A8, A8S, A5, A7, and A6 would be overtopped at elevations less than the overflow weir at Alviso Slough, and therefore the capacity of the A8 system's ponds is much larger than the volume displaced by habitat transition zones. Because adaptive management would be used to actively monitor and assess flood-protection measures and existing levels of flood protection would be maintained, impacts to flood protection would be less than significant.

3.2.18 Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (No Action), no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System in accordance with the AMP and other Refuge management documents and practices. The Ravenswood pond cluster would continue to be managed through activities described in the AMP. Ponds R3, R4 and R5/S5 would function as seasonal ponds. Seasonal ponds are passively managed as seasonal wetlands that receive direct precipitation, groundwater inflows, and minimal overland runoff during the wet season. During the dry season, seasonal ponds are allowed to dry out by seepage and evaporation.

The outboard levees along Ponds R4 and R3 provide inland flood protection and would continue to be maintained or repaired as a component of the USACE 1995 operations and maintenance permit.

Bayward-facing levees would continue to provide some level of coastal flood protection from wave action as waves break against the levees. If waves overtop the outboard salt pond levees, the ponds would provide storage and dissipate wave energy. Under the No Action scenario, it is assumed that unanticipated breaches in the Ravenswood Ponds would be repaired so as to maintain current levels of flood protection.

Adaptive management would also be used to actively monitor and assess existing flood-protection measures. Therefore impacts to flood risk would be less than significant.

3.2.19 Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Phase 2 actions would initiate the transition of Pond R4 from a seasonal pond to tidal marsh, while maintaining or improving the existing levees and the overall flood protection provided by the pond. Ponds R5 and S5 would be converted from seasonal ponds to managed ponds through the construction of water control structures and some earthmoving. Pond R3 would become an enhanced managed pond through a water-control structure would be installed on Pond R3's outer levee (adjacent to Ravenswood Slough) to improve forage habitat for the western snowy plover.

Pond R4 would be breached to Ravenswood Slough to allow tidal flows within the pond. The Pond R4 levee adjacent to Greco Island would be lowered to provide habitat connectivity between Pond R4 and Greco Island. The southern levee for Pond R4 would be improved to provide flood protection for areas south of the Ravenswood Ponds. Other Phase 2 actions would create a habitat transition zone along the western edge of Pond R4, create and extend pilot channels at a slough trace, remove levees between Ponds R5 and S5 to increase pond connectivity, and improve recreation and access.

The breach in the Pond R4 levee would allow full tidal inundation, and the internal side of the R4 levees would therefore be subject to tidal flows. This would reduce the level of flood protection provided by these levees. However, the levee along the southern side of Pond R4 (at the All-American Canal [AAC]) would be raised such that the current level of flood protection provided to landward areas would be maintained or exceeded. Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended. Therefore impacts to flood protection would be less than significant.

3.2.20 Alternative: Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would have similar effects to those described above for Alternative Ravenswood B with the following exceptions: Pond R4 would also be breached to the channel between it and Greco Island, an additional habitat transition zone would be constructed, Ponds R5 and S5 would be converted to managed mudflats, a second water-control structure would be installed on Pond R3 (at its western border with Pond S5) to further improve forage habitat for the western snowy plover, and additional recreational and public access components would be constructed.

Similar to the effects described above for Alternative Ravenswood B, the breaches in the Pond R4 levee would allow full tidal inundation to Pond R4, and therefore the internal side of the Pond R4 levees would be subject to tidal flows. This would reduce the level of flood protection provided by these levees.

However, the levee along the southern side of Pond R4 (at the AAC) would be raised such that the current level of flood protection for landward areas would be maintained or exceeded. Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended. Therefore, impacts to flood protection would be less than significant.

3.2.21 Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create habitat transition zones in Pond R4, install water control gates on Pond R3, remove levees within and between Ponds R5 and S5, convert Ponds R5 and S5 to enhanced managed ponds, allow stormwater outflow from Redwood City to Ponds R5 and S5, and improve recreation and public access.

Similar to the effects described above for Alternative Ravenswood B, the breaches in the Pond R4 levee would allow full tidal inundation to Pond R4, and therefore the internal side of the Pond R4 levees would be subject to tidal flows. This would reduce the level of flood protection provided by these levees.

However, the levee along the southern side of Pond R4 (at the AAC) would be raised such that the current level of flood protection provided to landward areas would be maintained or exceeded.

Currently, local flooding can occur at Redwood City's Bayfront Canal and Atherton Channel when Flood Slough is at high tide because of inadequate drainage. Under Alternative Ravenswood D, peak flood flows could be redirected from the Bayfront Canal and Atherton Channel into Ponds R5 and S5, bypassing the Flood Slough tide gate. Ponds R5 and S5 would be used for temporary stormwater detention, which would reduce the amount of local flooding and provide additional flood protection.

Monitoring and adaptive management would be used to verify that the Phase 2 actions are performing as intended. Therefore, impacts to flood protection would be less than significant under CEQA and would be beneficial under NEPA.

3.2.22 Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.2-2: Alter existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (No Action) existing drainage patterns within the Island Ponds and adjacent sloughs would be maintained (i.e., the ponds would fill and drain with the tides). Tidal scour would continue to widen the pond breaches until equilibrium conditions are met. Marsh channels within the Alviso-Island pond cluster would continue to develop, increasing habitat complexity and allowing the ponds to drain quickly. Sediment accretion rates within the ponds would remain similar to existing conditions until the bottom elevations increase. Coyote Creek could experience some degree of tidal scour; however, effects to downstream pond levees would be minimal because the Coyote Creek channel is wide and has experienced tidal flows from the Island Ponds for several years.

Another potential effect of salt pond restoration is that breached ponds, acting as new sediment sinks, could shift sediment dynamics within the South Bay, increasing erosion in adjacent marshes and mudflats. Results from analyses of sediment dynamics in tidal channels adjacent to the Island Ponds have indicated that sedimentation at the Island Ponds did not come at the expense of adjacent mudflats and tidal-marsh habitats. For example, sediment accumulated relatively rapidly within Pond A21 following levee breachings (approximately twice as fast as typical marshes); concurrently, sediment continued to accumulate on adjacent mudflats on Coyote Creek and Mud Slough. Large-scale erosion of the adjacent mudflats and tidal marshes was not observed (Callaway et al. 2013). Under Alternative Island A, sediment would continue to accumulate within the Island Ponds until elevations are raised and accretion rates decrease. Local sediment input from the South Bay and from Coyote Creek would likely continue to meet sediment demand from the Island Ponds without substantial changes to nearby mudflats. Therefore, impacts would be less than significant.

3.2.23 Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, drainage patterns within Pond A19 and Mud Slough would change because Pond A19 would be breached to Mud Slough. Sediment accretion rates would increase in the northern side of Pond A19. Marsh channels in the northern portion of the pond would develop more rapidly, increasing habitat complexity. The new breaches and the Mud Slough channel would be affected by tidal scour. Levee breaches would increase tidal flows in Mud Slough downstream of the breach, widening and deepening the slough over time. Slough width and depths upstream of the breaches would be less affected by levee breaching. Widening and deepening Mud Slough could erode levees downstream of the breach, which may be a concern for the ponds on the north bank of Mud Slough. (Ponds A20 and A21 are already fully tidal, and therefore unexpected breaches would not substantially change habitat in these ponds.) These effects would be monitored through the AMP, and corrective actions could be implemented if downstream levees fail to meet performance standards.

Although sediment distribution within the ponds would change due to the northern breaches in Pond A19, total sediment demand from the ponds would not increase. Net accretion rates may increase somewhat, but additional accretion would be minor compared to the initial breaching of the ponds. Therefore, potential erosion to nearby mudflats is also expected to be minor. Impacts from changes in existing drainage patterns would be less than significant.

3.2.24 Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, all of the Island Ponds would be breached to Mud Slough. Effects from tidal scour would be similar to those effects described above under Alternative Island Pond B except that the northern side of Ponds A20 and A21 would also have increased sediment accretion rates and larger marsh channels. Net accretion rates may increase somewhat, but erosional effects to nearby mudflats would be minor. Therefore, impacts from changes in existing drainage patterns would be less than significant.

3.2.25 Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (No Action), existing drainage patterns would be maintained. The Mountain View Ponds would continue to be managed for limited tidal circulation through gated control structures and siphons. The potential for sediment accretion within the ponds and erosion from circulating water within the ponds would be minimal because the ponds would not be subject to tidal inundation. Therefore, impacts would be less than significant.

3.2.26 Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Mountain View B, Ponds A1 and A2W would be breached to tidal flows. Therefore, existing drainage patterns within the ponds and tidal flows in adjacent sloughs would be altered. Tidal scour would widen pond breaches and widen and deepen adjacent sloughs until equilibrium conditions are met. Sediment from the incoming tide would settle out within the ponds as they fill and drain. Marsh channels would form near the breaches, allowing the ponds to drain faster. As the pond elevation increases, vegetation would become established, stabilizing sediments and increasing habitat complexity.

Widening and deepening Mountain View Slough (below Permanente Creek) and Whisman Slough (below Stevens Creek) could erode adjacent levees. This may be of concern for the outboard salt pond levees in Ponds A2E and AB1 at Whisman Slough. These effects would be monitored through the AMP, and corrective actions could be implemented if downstream levees fail to meet performance standards.

Breaching Ponds A1 and A2W would enable sediment accretion within the ponds. This increased sediment demand could be met by local tributaries, sediment influx from Bay areas north of the Dumbarton Bridge, imported dredge materials, and/or from other nearby sediment sources. If naturally supplied sediment sources are exceeded, the breaching of the salt ponds has the potential to cause erosion in adjacent mudflats.

The long-term regional sediment supply in the far South Bay has been studied by Shellenbarger et al. (2013) for the area of the SBSP Restoration Project. It is estimated that between 29 and 45 million cubic meters of sediment would be required to raise all of the area of the SBSP Restoration Project to mean tidal level. Sediment influx from the South Bay (north of the Dumbarton Bridge) would supply this amount of sediment in about 90 to 600 years.[4] This estimate reflects the long-term regional sediment supply, assuming that there is no net loss of mudflats and marshes in the area and that the volume of sediment needed in the ponds does not change due to sea-level rise or construction. However, some of the subsided ponds would be maintained as managed ponds and not restored to tidal action, so Phase 2 of the SBSP Restoration Project may require less sediment than the estimate provided here. Furthermore, in order to meet the sediment deficit without scouring mudflats, restoration would either be phased over many decades to match sediment demand with the rate at which sediment naturally enters the far South Bay, or ponds would be partially filled with clean dredged sediments and/or upland material.

With respect to the breaching of Ponds A1 and A2W, sediment demand in these ponds is not expected to exceed naturally supplied sediment supply because the size of the ponds is small compared to the overall restoration area. Effects to nearby mudflats would be monitored through the AMP, and corrective actions would be implemented if performance metrics are not met (i.e., phasing future tidal restoration within the project vicinity or importing fill material to the ponds). Therefore impacts from erosion and accretion due to changes in existing drainage patterns would be less than significant.

[4] These data are based on using water year 2009 and 2010 sediment budget results. Also, the program-level Alterative C analyzed in the SBSP Restoration Project 2007 EIS/R had an upper range of 90 percent tidal restoration, not 100 percent tidal restoration.

3.2.27 Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, ponds would be breached to Charleston Slough, Mountain View Slough, and Whisman Slough. The Pond A1 levee would be lowered at Charleston Slough, and the flood control levee on the west bank of Charleston Slough would be improved. These actions would allow sediment accretion in the ponds but would also increase tidal scour in the sloughs. Effects from tidal scour and sediment demand would be similar to the effects described above under Alternative Mountain View B, with the exception that Charleston Slough is expected to scour bayward of the breach location and import sediment from the Bay and lose sediment to Pond A1 landward of the breach location. These effects would be monitored through the AMP, and corrective actions could be implemented if performance standards were not met. Therefore impacts from changes in existing drainage patterns would be less than significant.

3.2.28 Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (No Action), existing pond operations and drainage patterns would be maintained. The A8 ponds would be operated to allow muted tidal exchange with Alviso Slough and Guadalupe Slough. The potential for erosion from water circulating within the ponds and accretion rates within the ponds would be minimal because the ponds are not fully tidal and because flows are mediated through engineered control structures. Tidal scour in Alviso Slough associated with A8 notch operations would continue to widen and deepen the slough until equilibrium conditions are met. These effects are monitored through the AMP and corrective actions could be implemented if downstream levees fail to meet performance standards. Therefore impacts would be less than significant.

3.2.29 Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, fill material would be used to create habitat transition zones in Pond A8S, but Phase 2 actions would not change existing drainage patterns. Pond accretion rates, pond circulation, and tidal scour from notch operations would continue to have effects similar to those described for Alternative A8 A. Therefore impacts would be less than significant.

3.2.30 Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (No Action), Ponds R3, R4, R5, and S5 would continue to be operated as seasonal ponds (i.e., they would be passively managed and allowed to dry out by evaporation during the dry season). No gated or culverted hydraulic connection between the ponds would be actively managed or used. Therefore, there would be no impact or change to the existing drainage patterns.

3.2.31 Alternative Ravenswood A Level of Significance: No impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to tidal inundation. The Pond R4 levee adjacent to Greco Island would also be lowered to allow inundation above mean high water. Therefore, existing drainage patterns within Pond R4 and tidal flows in Ravenswood Slough would be altered. Tidal flows in sloughs between Pond R4 and Greco Island as well as within Greco Island would also be changed, but to a lesser degree. Tidal scour would widen the breach and widen and deepen Ravenswood Slough until equilibrium conditions are met. Marsh channels near the breach would increase in complexity. Sediment from the incoming tide would settle out within Pond R4 as it fills and drains.

Water control structures would also be constructed to connect Pond R4 to Pond R5 and Pond S5 to Flood Slough, allowing active control of water surface elevations in Ponds R5 and S5. Water surface elevations and circulation would be actively managed in these ponds, which would change existing drainage patterns. However, erosion and increased tidal scour in Flood Slough would likely be minimal because tidal flows would be restricted by the control structures. A separate water control structure would be added to Pond R3 at its eastern levee to connect it to Ravenswood Slough. This structure would enable management on pond water levels to improve forage habitat for western snowy plover.

Although sediment demand in the Ravenswood pond complex would increase, it is not expected that sediment demand in these ponds would exceed the naturally supplied sediment supply because the size of the ponds is small compared to the overall restoration area. Effects to nearby mudflats would be monitored through the AMP, and corrective actions would be implemented if performance metrics are not met (i.e., phasing future tidal restoration within the project vicinity or importing fill material to the ponds). Therefore, impacts would be less than significant.

3.2.32 Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, drainage patterns within the ponds and adjacent sloughs would be altered by levee breaches (and to a lesser extent by water control structures) in a manner similar to Alternative Ravenswood B, with the addition of a second water control structure to manage flows in Pond R3, increased tidal flows in the sloughs on the perimeter of Greco Island, and potentially managed flows in Ponds R5 and S5.

Pond R4 would be breached to tidal inundation towards Ravenswood Slough and Greco Island, and tidal flows in adjacent sloughs (including perimeter sloughs in and around Greco Island) would increase. Tidal scour would widen the pond breaches and widen and deepen adjacent sloughs until equilibrium conditions are met. Marsh channels near the breaches would increase in complexity. Sediment from the incoming tide would likely settle out within Pond R4 as it fills and drains.

Water control structures would be used to increase flows in Pond R3 and to control water surface elevations in Ponds R5 and S5 to maintain mudflat elevations. Operation of the water control structures would not cause substantial erosion or siltation. Accretion rates within these ponds could slightly increase, and marsh channels located near control structures could increase in complexity. Flows would be restricted by the control structures, and therefore tidal scour in adjacent sloughs near the control structures would likely be minimal.

Although sediment demand in the Ravenswood pond complex would increase, it is not expected that sediment demand in these ponds would exceed the naturally supplied sediment supply because the size of the ponds is small compared to the overall restoration area. Effects to nearby mudflats would be monitored through the AMP, and corrective actions would be implemented if performance metrics are not met (i.e., phasing future tidal restoration within the project vicinity or importing fill material to the ponds). Therefore, impacts would be less than significant.

3.2.33 Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, drainage patterns within the Ravenswood Ponds and adjacent sloughs would be altered by a levee breach and by water control structures. Levee breaches would increase tidal scour in Ravenswood Slough, potentially widening and deepening the slough over time. Sediment from the incoming tide would likely settle out within Pond R4 as it fills and drains.

Water control structures would be used to manage water levels in Ponds R3, R5, and S5. Operation of the water control structures would not cause substantial erosion or siltation. Accretion rates within these ponds could slightly increase due to settling of suspended sediments from incoming flows. Flows would be restricted by the control structures and therefore tidal scour in adjacent sloughs near the control structures would likely be minimal. Local drainage from the Bayfront Canal and Atherton Channel would be redirected to Ponds R5 and S5, and these ponds would be used to detain local flows. Temporary detention of the peak flows may decrease fluvial scour in Flood Slough.

Although sediment demand in the Ravenswood pond complex would increase, it is not expected that sediment demand in these ponds would exceed the naturally supplied sediment supply because the size of the ponds is small compared to the overall restoration area. Effects to nearby mudflats would be monitored through the AMP, and corrective actions would be implemented if performance metrics are not met (i.e., phasing future tidal restoration within the project vicinity or importing fill material to the ponds). Impacts would be less than significant.

3.2.34 Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.2-3: Create a safety hazard for people boating in the project area.

Alviso-Island Ponds

Alternative Island A (No Action). The Phase 2 area of the SBSP Restoration Project currently contains few navigable sloughs and waterways – major sloughs have silted in over a period of decades, reducing navigability. At low tide, navigation into or out of shallow sloughs can be problematic. Small craft (e.g., kayaks) are more amenable to the shallow water environments and are more likely to navigate tidal sloughs. Unless explicitly allowed pursuant to a compatibility determination, navigation within restored ponds would not be allowed. As part of the compatibility determination, the USFWS and CDFW could restrict navigation according to season (e.g., no access during breeding season), by type of access (e.g., non-motorized versus motorized), or type of use (e.g., waterfowl hunting only).

Under Alternative Island A (No Action), tidal inundation would continue to cause the levees previously breached to Coyote Creek to scour and widen. Coyote Creek could also experience some degree of tidal scour; however, effects would be minimal because the Coyote Creek channel is wide and has experienced tidal flows from the Island Ponds for several years. Therefore potential benefits to navigation under Alternative Island A would be minor. Impacts would be less than significant.

3.2.35 Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, Pond A19 would be breached to Mud Slough. Breaching levees to Mud Slough would widen and deepen the slough, improving navigation. Immediately after breaching, tidal currents through the breaches and in the sloughs downstream of the breaches would be stronger. High current velocities (e.g., peak values of approximately 5 to 7 fps) and turbulent flow may occur in the immediate vicinity of the breach. This may limit safe navigation of small watercraft to certain periods of the tide cycle (near slack tide). Navigation in the immediate vicinity of the breaches could be dangerous until the channel scoured sufficiently. USFWS would restrict navigation in the vicinity of the breaches in the short term, if needed, for safety.

Due to the limited amount of boating expected in Mud Slough, Phase 2 actions would not result in significant adverse impacts to navigation. Over a period of years, Mud Slough is expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term. Therefore, impacts would be less than significant.

3.2.36 Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, short-term impacts and long-term benefits to navigation would be similar to the impacts discussed under Alternative Island B except that tidal flow may be greater in Mud Slough because of additional levee breaches. Due to the limited amount of boating expected in Mud Slough, Phase 2 actions would not result in significant adverse impacts to navigation. Over a period of years, Mud Slough is expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term. Therefore impacts would be less than significant.

3.2.37 Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Levees would not be breached under Alternative Mountain View A, and existing operations and pond circulation patterns would be maintained. Sloughs adjacent to the ponds are likely depositional, with unconsolidated sediment being transported during winter storm events. These sloughs would continue to be shallow, with reduced navigability. Impacts would be less than significant.

3.2.38 Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to Charleston Slough, Mountain View Slough, and/or Whisman Slough. Unless explicitly allowed pursuant to a compatibility determination, navigation within the restored ponds would not be allowed. As part of the compatibility determination, the USFWS could restrict navigation according to season (e.g., no access during breeding season), by type of access (e.g., non-motorized versus motorized), or type of use (e.g., waterfowl hunting only). The PG&E boardwalks added and raised under this alternative would be physical barriers to inadvertent boat access into the sloughs and the ponds. The bridges over armored breaches on the east side of Pond A2W would similarly prevent boat entry into this pond.

Breaching levees to adjacent sloughs would widen and deepen the sloughs. However, immediately after breaching, tidal currents through the breaches and in the sloughs downstream of the breaches would be stronger. High current velocities (e.g., peak values of approximately 5 to 7 fps) and turbulent flow may occur in the immediate ***vicinity*** of the breaches. These flows may limit safe navigation of small watercraft within the sloughs to certain periods of the tide cycle (e.g., near slack tide). Navigation in the immediate vicinity of the breaches could be dangerous until the channel scoured sufficiently. USFWS would restrict navigation in the vicinity of the breaches in the short term, if needed, for safety.

Due to the restrictions on boating and the creation of several physical barriers to boat entry in the Mountain View Ponds ***and*** surrounding sloughs, Phase 2 actions would not result in significant adverse impacts to navigation. Over a period of years, Whisman Slough, Mountain View Slough, and Charleston Slough (downstream of the control structure) are expected to scour, increasing channel dimensions.

Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term. Therefore impacts would be less than significant.

3.2.39 Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, short-term potential impacts and the physical barriers and regulatory prohibitions to navigation would be similar to those discussed under Alternative Mountain View B. The Phase 2 actions would not result in significant adverse impacts to navigation.

3.2.40 Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). The Alviso Marina is located on the eastern side of Alviso Slough adjacent to the community of Alviso. The marina and boat dock is located downstream of the A8 notch. The UPRR bridge, located approximately 1,000 feet upstream of the Alviso Marina, limits boat passage, and therefore, there is little upstream traffic within the vicinity of the A8 notch.

Under Alternative A8 A, pond operations and tidal flows would not change in comparison to existing conditions. Long-term operation of the notch would continue to widen and deepen downstream portions of Alviso Slough, improving navigation. However, flows through the notch are muted and continued tidal scour is likely minimal. Therefore, potential benefits to navigation under Alternative A are expected to be minor. Impacts would be less than significant.

3.2.41 Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Phase 2 actions under Alternative A8 B are limited to habitat transition zone construction, which would not change existing pond operations. Pond circulation and tidal scour from notch operations would continue to have effects similar to those described under Alternative A8 A. Therefore, impacts would be less than significant.

3.2.42 Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Levees would not be breached under Alternative Ravenswood A, and Ponds R3, R4, R5, and S5 would continue to be operated as seasonal ponds – no gated or culverted hydraulic connections would be actively managed or used. Sloughs adjacent to the ponds are likely depositional, with unconsolidated sediment being transported during winter storm events. These sloughs would continue to be shallow, with reduced navigability. Impacts to navigation would be less than significant.

3.2.43 Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to Ravenswood Slough. Ponds R3 and S5 would be connected to Ravenswood Slough and Flood Slough, respectively, through water control structures. Levees adjacent to Greco Island would also be lowered to allow inundation above mean high water. Unless explicitly allowed pursuant to a compatibility determination, navigation within the restored ponds would not be allowed. Furthermore, bottom elevations within this pond are relatively high, limiting potential boating.

Breaching the Pond R4 levee to Ravenswood Slough would widen and deepen the slough, eventually improving navigation. However, immediately after breaching, tidal currents through the breach and in the slough downstream of the breach would be stronger. High current velocities (e.g., peak values of approximately 5 to 7 fps) and turbulent flow may occur in the immediate vicinity of the breach. These flows may limit safe navigation of small watercraft in the slough to certain periods of the tide cycle (e.g., near slack tide). Navigation in the immediate vicinity of the breaches could be dangerous until the channel scoured sufficiently. The USFWS would restrict navigation in the vicinity of the breaches in the short term, if needed, for safety.

Due to the limited amount of boating expected in the area, Phase 2 actions would not result in significant adverse impacts to navigation. Over a period of years, Ravenswood Slough is expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breach and provide improved navigation in the long term. Therefore impacts to navigation would be less than significant.

3.2.44 Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Pond R4 would be breached to Ravenswood Slough and to a slough near Greco Island under Alternative Ravenswood C. Several water control structures would also be constructed to connect Ponds R3, R5, and S5 to adjacent sloughs. Tidal flows within Ravenswood Slough and Greco Island sloughs would be affected by the breaches. To a lesser extent, flow through the water control structures would also affect downstream areas.

Under Alternative Ravenswood C, short-term impacts and long-term benefits to navigation would be similar to the impacts discussed under Alternative Ravenswood B. Tidal flows in sloughs between Pond R4 and Greco Island as well as within Greco Island would also be changed. High current velocities and turbulent flow may occur in the immediate vicinity of the breach. The USFWS would restrict navigation in the vicinity of the breaches in the short term, if needed for safety. Signage would be posted regarding potential safety hazards notifying kayakers and other users of small craft of possible risks. Over a period of years, adjacent sloughs are expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term. Therefore impacts would be less than significant.

3.2.45 Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Pond R4 would be breached to Ravenswood Slough under Alternative Ravenswood D. Several water control structures would also be constructed to connect Ponds R3, R5, and S5 to adjacent sloughs. Tidal flows through breaches, and to a lesser extent, flow through the water control structures would affect adjacent sloughs.

Under Alternative Ravenswood D, short-term impacts and long-term benefits to navigation would be similar to the impacts discussed under Alternative Ravenswood B and Alternative Ravenswood C. Due to the limited amount of boating expected in nearby sloughs, Phase 2 actions would not result in significant adverse impacts to navigation. Over a period of years, adjacent sloughs are expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term. Therefore, impacts would be less than significant.

3.2.46 Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.2-4: Potential effects from tsunami and/or seiche.

Alviso-Island Ponds

Alternative Island A (No Action). The Alviso-Island pond cluster is subject to tsunami and/or seiche events. Under Alternative Island A, no new improvements to existing levees would occur. Existing levees that protect the existing UPRR rail line between ponds A21 and A20 would be maintained. This alternative would allow the existing breached levees to continue to be scoured from hydraulic action and to naturally degrade over time. As such, no maintenance to repair or improve portions of levees for increased performance during a tsunami and/or seiche would occur under Alternative Island A. However, because Alternative Island A would not construct habitable structures and warning systems would allow for evacuation of the shoreline in the event of a tsunami, inundation by a tsunami would not expose people to potential injury or death. Therefore, impacts to the existing environmental conditions of a tsunami and/or seiche would be less than significant.

3.2.47 Alternative Island A (No Action) Level of Significance: Less than Significant

Alternative Island B. Impacts resulting from Alternative Island B would be the same as those described under Alternative Island A. Therefore, impacts to existing or proposed conditions resulting from tsunami and/or seiche would be less than significant.

3.2.48 Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Impacts described under Alternative Island C would be the same as those described under Alternative Island A.

3.2.49 Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). The Alviso-Mountain View pond cluster is subject to a tsunami/seiche event. Under Alternative Mountain View A, the high-priority levees around Ponds A1 and A2W would be maintained for inland flood protection. These outboard levees would also be repaired upon failure; however, no direct improvements that might improve their performance during a tsunami and/or seiche are proposed as part of regular maintenance.

In areas where a tsunami could overtop a levee, ponds and adjacent areas may be flooded and erosion of levee slopes may be accelerated. Existing warning systems would allow for evacuation of the shoreline in the event of a tsunami, so inundation by a tsunami would not expose people to potential injury or death. Therefore impacts to the existing environmental conditions or proposed conditions of a tsunami and/or seiche would be less than significant.

3.2.50 Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, the northern perimeter levee and the northern portion of the western perimeter levee at Pond A1, the eastern levee of Pond A1, and the western levee of Pond A2W would not be maintained. The proposed new or improved and raised levee between Charleston Slough and Pond A1 would be designed for increased performance during a tsunami and/or seiche. Because Alternative Mountain View B would allow the northern perimeter levee and the northern portion of the western perimeter levee at Pond A1, the eastern levee of Pond A1, and the western levee of Pond A2W to degrade over time, the minimal flood protection these levees provide now would degrade over time. However, as that occurs, the transition of Ponds A1 and A2W to tidal marsh over time and the addition of habitat transition zones would provide a new measure of flood protection against tsunamis and/or seiches.

This alternative would not include construction of habitable structures. Additionally, warning systems would allow for evacuation of the shoreline in the event of a tsunami, so inundation by a tsunami would not expose people to potential injury or death. Therefore, impacts under this alternative resulting from a tsunami and/or seiche would be less than significant.

3.2.51 Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Impacts resulting from a tsunami and/or seiche under Mountain View C would be the same as those described under Mountain View B; however, the levee separating the Palo Alto Flood Basin from Charleston Slough would be improved and the levee separating Charleston Slough and Pond A1 would be lowered. Warning systems would allow for evacuation of the shoreline in the event of a tsunami, so inundation by a tsunami would not expose people to potential injury or death.

Therefore impacts under this alternative resulting from a tsunami and/or seiche would be less than significant.

3.2.52 Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, there would be no maintenance to repair or improve portions of levees for increased performance during a tsunami and/or seiche. In areas where a tsunami overtops levees, ponds and adjacent areas may be flooded and erosion of levee slopes may be accelerated. Because warning systems would allow for evacuation of the shoreline in such an event, inundation by a tsunami would not expose people to potential injury or death.

3.2.53 Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, up to two habitat transition zones would be constructed in the southern corners of Pond A8S, but the A8 Ponds would remain under muted tidal control. Because of this, these activities would not change the potential for adverse effects from tsunami or seiche waves in or around these ponds relative to the baseline conditions. Impacts resulting from a tsunami and/or seiche under Alternative A8 B would be the same as those described under Alternative A8 A.

3.2.54 Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action)**.** The Ravenswood pond cluster is subject to tsunami and/or seiche events. Under Ravenswood Alternative A, the high-priority levees on the bayward side of Ponds R3 and R4 would be maintained for inland flood protection. These outboard levees would also be repaired upon failure; however, no direct improvements that might improve their ability to mitigate the effects of a tsunami and/or seiche are proposed.

In areas where a tsunami could overtop a levee, ponds and adjacent areas may be flooded and erosion of levee slopes may be accelerated. However, warning systems would allow for evacuation of the shoreline in such an event, so inundation by a tsunami would not expose people to potential injury or death.

Therefore, impacts to existing conditions resulting from a tsunami and/or seiche would be less than significant under Alternative Ravenswood A.

3.2.55 Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, the project would maintain the existing outward levee at Pond R3, and the levee between Pond R3 and R4 along the AAC would be designed to maintain or increase the current levels of performance during a tsunami and/or seiche.

The proposed project would not include construction of habitable structures. Additionally, warning systems would allow for evacuation of the shoreline in the event of a tsunami, so inundation by a tsunami would not expose people to potential injury or death. Therefore, impacts to existing or proposed conditions resulting from a tsunami and/or seiche would be less than significant.

3.2.56 Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Impacts resulting from a tsunami and/or seiche under Alternative Ravenswood C would be the same as those described under Alternative Ravenswood B.

3.2.57 Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Impacts resulting from a tsunami and/or seiche under Alternative Ravenswood D would be the same as those described under Alternative Ravenswood B.

3.2.58 Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary Table

Phase 2 impacts and levels of significance are summarized in Table 3.2-1. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP and other Refuge management documents and practices. The hydrology, flood management, and infrastructure analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.2-1 Phase 2 Summary of Impacts – Hydrology, Flood Management, and Infrastructure

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.2-1: Increased risk of flooding that could cause injury, death, or substantial property loss.	LTS	LTS	LTS	LTS	LTS	LTS/ B	LTS	LTS	LTS	LTS	LTS	LTS/ B
Phase 2 Impact 3.2-2: Alter existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.2-3: Create a safety hazard for people boating in the project area.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.2-4: Potential effects from a tsunami and/or seiche.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action (No Project Alternative under
CEQA). B = Beneficial
LTS = Less than
Significant NI = No Impact

3.3 Water Quality and Sediment

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing water quality within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on water quality. Given that many of the water quality constituents of concern are found in and exchange with sediment, sediment distribution and composition is described here as well. The information presented is based on a review of existing water and sediment quality within the area, and other pertinent federal, state, and local regulations, which are presented in Section 3.3.2, Regulatory Setting. Section 3.3.1, Physical Setting, is included to establish the origin and environmental context of the resources. Using this information as context, an analysis of the water-quality-related environmental impacts of the project is presented for each alternative in Section 3.3.3, Environmental Impacts and Mitigation Measures. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of the project. Therefore, this section only includes additional, project-level mitigation measures as needed.

3.3.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project EIS/R (2007 EIS/R), which was both a programmatic EIS/R and a Phase 1 EIS/R. Information regarding water quality in the regional and Phase 2 project setting was primarily based on data collected by the San Francisco Estuary Institute (SFEI) Regional Monitoring Program (RMP), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS) and sampling conducted as part of the SBSP Restoration Project's Initial Stewardship Program (ISP) or Phase 1 actions, Adaptive Management Plan (AMP) special studies, and other special studies from the SBSP Restoration Project and the Santa Clara Valley Water District (SCVWD).

Regional Setting

Surface Water and Sediment Quality

The former salt ponds are at the interface between the urban environment and San Francisco Bay (Bay). The regional setting includes the South Bay itself, the SBSP Restoration Project pond complexes, and upland watershed areas. Water quality conditions for mercury, persistent organic constituents, other metals, and general water quality conditions (e.g., nutrients and dissolved oxygen) are discussed in this section. Regional water and sediment quality are also discussed in comparison to water and sediment quality guidelines, criteria, and objectives established by the Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB).

Mercury. Mercury occurs naturally in the Bay environment and has been introduced as a contaminant in various chemical forms from a variety of anthropogenic sources. Ambient levels of sediments in the Bay are elevated in total mercury above naturally occurring background levels. Although mercury often resides in forms that are not hazardous, it can be transformed through natural processes into toxic methylmercury.

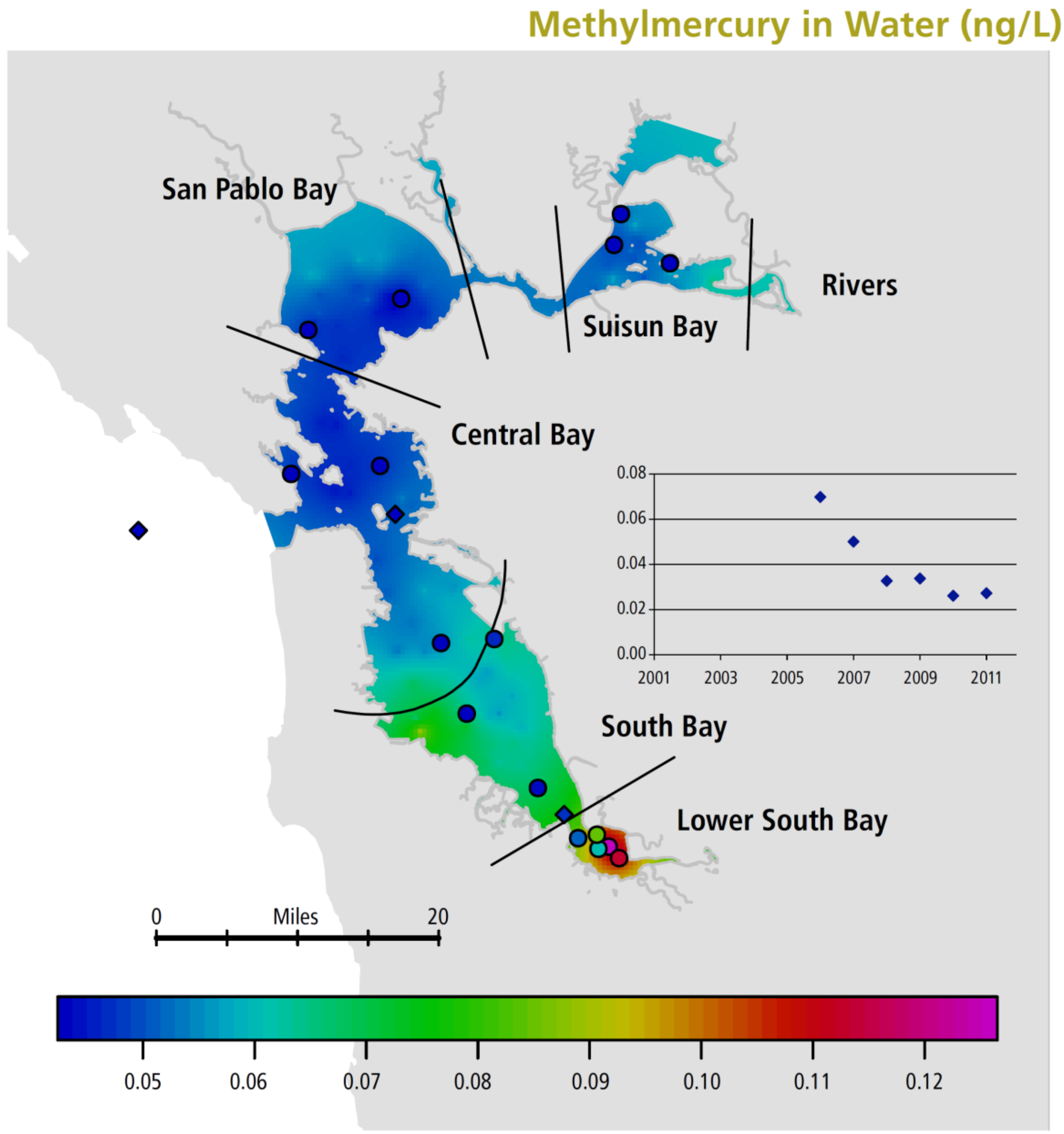
The primary concern with mercury contamination in the Bay is the accumulation of methylmercury in organisms, particularly at the top of aquatic food webs. Methylmercury typically represents only about 1 percent of the total of all forms of mercury in water or sediment, but it is the form that is readily accumulated in the food web and poses a toxicological threat to exposed species (SFEI 2012). Elevated methylmercury levels in fish can result in mercury exposure in humans who consume contaminated fish. Elevated levels of methylmercury can also adversely affect the health and fitness of fish and birds.

Methylmercury is produced in aquatic ecosystems through the methylation of inorganic mercury by microorganisms. Methylmercury has a complex cycle, influenced by many processes that vary in space and time. The rate of methylation is a function of an array of variables, including mercury levels, mercury speciation, oxidation reduction potential, microbial activity, sulfate levels, salinity, pH, dissolved oxygen, dissolved organic carbon, turbidity, solar radiation, and vegetation type. Although the interaction of these variables is not fully understood, wetlands are known to be significant sites of microbial methylation and potentially important sources of methylmercury to aquatic food webs (Benoit et al. 2003; Wiener et al. 2003). Natural accretion processes in salt marshes continually supply fresh layers of mercury-contaminated sediments, which can release mercury in a form that can become biologically available to mercury-methylating bacteria and subsequently bioaccumulate in the food chain. Because of the complex interactions between biological/physical processes, it is difficult to predict mercury concentrations in fish or other aquatic organisms, or birds, and water or sediment mercury concentrations.

Methylmercury and mercury concentrations in surface waters and sediment of the South Bay and the SBSP Restoration Project area have been evaluated by regional monitoring activities in the Bay (e.g., RMP) and by studies prepared for the SBSP Restoration Project. The South Bay and the lower South Bay have higher-than-average long-term methylmercury water concentrations when compared to other sections of the Bay (see Figure 3.3-1). For example, methylmercury concentrations in bay water during 2002 to 2011 averaged 0.11 nanogram per liter (ng/L) for the lower South Bay and 0.06 ng/L for the portion of the South Bay north of the Dumbarton Bridge. These water concentrations can be compared to a Bay-wide average of 0.04 ng/L (SFEI 2012). Average total mercury concentrations were also higher in the lower South Bay than in the rest of the Bay during 2002 to 2011 (18 ng/L in the lower South Bay as compared to 9 ng/L elsewhere), but mercury concentrations in the South Bay north of the Dumbarton Bridge were similar to Bay-wide average concentrations (9 ng/L). No regulatory guidelines exist for methylmercury concentrations in surface water—regulatory guidelines for methylmercury target fish tissue concentrations.

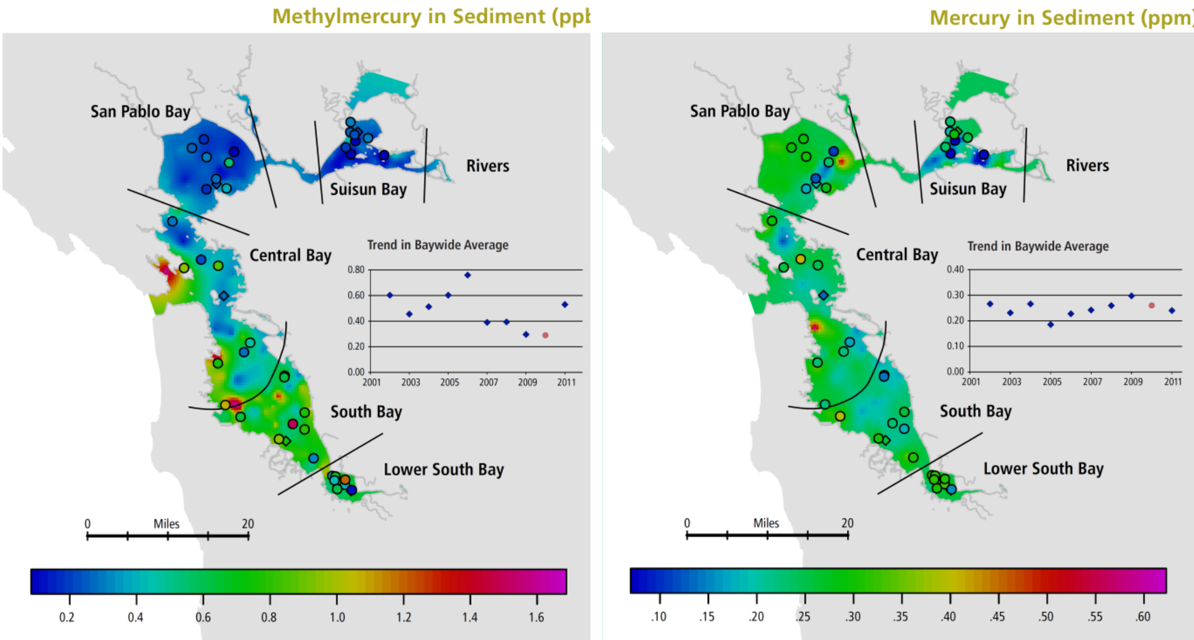
Methylmercury concentrations in sediment (2002 to 2011) averaged 0.72 microgram per kilogram (µg/kg) or part per billion (ppb) in the South Bay and 0.68 ppb in the lower South Bay, as compared to a Bay-wide average of 0.50 ppb. These concentrations indicate that long-term average sediment concentrations of methylmercury in the South Bay and lower South Bay are higher than Bay-wide averages. In contrast to methylmercury, the long-term average total mercury concentrations in sediment are similar in the lower South Bay and slightly lower (though perhaps not statistically significantly so) in the South Bay relative to other parts of the Bay (see Figure 3.3-2). Total mercury concentrations in sediment (2002 to 2011) averaged 0.26 milligram per kilogram (mg/kg) or part per million (ppm) in the lower South Bay and 0.22 ppm in the South Bay north of Dumbarton Bridge, and Bay-wide mercury concentrations averaged 0.25 ppm. Bay-wide average concentrations of total mercury in sediment have shown relatively little variability over this period (SFEI 2012). These concentrations provide an example of the lack of correlation between total mercury and methylmercury concentrations in sediment. No regulatory standards exist for methylmercury or mercury concentrations in sediment.

Figure 3.3-1. Regional Methylmercury Concentrations in Surface Water



Source: 2012 Regional Monitoring Program Update, SFEI 2012

Figure 3.3-2. Regional Mercury and Methylmercury Concentrations in Sediment



Source: 2012 Regional Monitoring Program Update, SFEI 2012

Sediment samples collected in South Bay salt ponds typically contained total mercury concentrations either similar to or slightly greater than ambient mercury concentrations in the Bay (Brown and Caldwell et al. 2005), with the exception of some ponds in the Alviso pond complex. Sediments in ponds near Alviso Slough have considerably higher mercury concentrations than Bay sediments (i.e., about 2 to 10 times the ambient Bay concentration) (Marvin-DiPasquale and Cox 2007). These higher concentrations are due to the mercury load that historically entered the lower South Bay from the Guadalupe River watershed, which contains the largest inactive mercury mining district in the United States (SFRWQCB 2008).

Organic Chemicals. Bioaccumulative pollutants such as polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and legacy organochlorine pesticides are of general concern in the Bay because concentrations in fish often exceed human-health-based criteria for fish consumption. PCBs are a class of organic chemicals that do not break down quickly in the natural environment and have been found to pose bioaccumulation risks. PCB data for the South Bay consistently exceeded human-health-based criteria for fish consumption (0.17 ng/L), but rarely exceeded saltwater aquatic-life-based criteria (30 ng/L). Average PCB concentrations in Bay sediment are higher in the Central and South Bay than in North Bay areas (Figure 3.3-3). The lower South Bay and the South Bay north of the Dumbarton Bridge have long-term (2002 to 2011) PCB concentrations greater then Bay-wide averages (10.7 ppb and 8.6 ppb, respectively, as compared to 7.2 ppb). Models suggest that sediment PCB concentrations must decline to about 1 ppb for concentrations in sport fish to fall below the threshold of concern for human health (SFEI 2012).

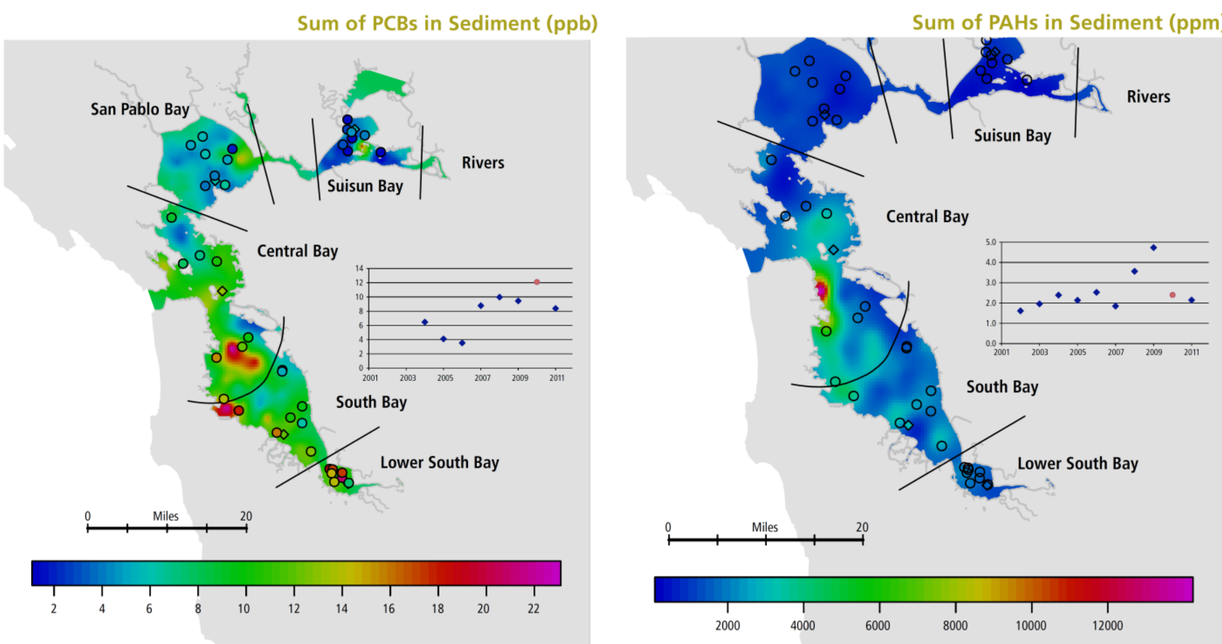
PAHs are known to be environmentally persistent and pose a concern for bioaccumulation. PAH data for the South Bay exceeded human-health-based criteria for fish consumption (8.8 ng/L), but are below the saltwater aquatic-life-based criteria. The Central Bay has had the highest average PAH sediment concentration (4.0 ppm) of any Bay segment. The South Bay (2.4 ppm) and lower South Bay (1.9 ppm) had PAH concentrations less than the Bay-wide long-term average of 2.6 ppm (SFEI 2012) (Figure 3.3-3).

Organochlorine pesticides (including chlordanes and dichloro-diphenyl-trichloroethanes [DDTs]) are also environmentally persistent and pose a concern for bioaccumulation. Chlordane and DDT concentrations in South Bay surface waters typically exceed human-health-based criteria. Chlordanes in South Bay sediments are often greater than ambient values (1.1 ppb) and sediment DDTs are similar to or greater than ambient values (7.0 ppb).

Within the SBSP Restoration Project area, sediments contained either non-detectable concentrations of organic constituents or concentrations below ambient values during ISP sampling events (USFWS and CDFG 2003). (The ISP sampling of the SBSPs focused primarily on the Alviso pond complex, and only a limited number of samples were collected in both the Eden Landing and the Ravenswood pond complexes.)

Other Metals. Metals can be persistent inorganic chemicals that are present in the environment due to both natural conditions and anthropogenic influences. Depending on the chemical nature of the metal, ecological risks could result from concentrations elevated above toxic thresholds or bioaccumulation levels.

Figure 3.3-3. Regional PCB and PAH Concentrations in Sediment



Source: 2012 Regional Monitoring Program Update, SFEI 2012

Copper and nickel are of particular concern for the Bay because ambient concentrations of dissolved copper and dissolved nickel can approach Basin Plan water quality objectives (6.9 micrograms per liter [µg/L] and 11.9 µg/L, respectively). The long-term average for dissolved copper is 3.2 µg/L in the lower South Bay and 2.4 µg/L in the South Bay north of the Dumbarton Bridge, which is greater than the Bay-wide average (1.9 µg/L). The long-term average for dissolved nickel is 3.0 µg/L in the lower South Bay and 2.1 μg/L in the South Bay north of the Dumbarton Bridge, which is greater than or equal to the Bay-wide average concentration (2.1 μg/L).[1]

Metals tested in SBSP Restoration Project waters include arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc; in general, metal concentrations were low. However, dissolved nickel concentrations often exceed the water quality objectives and dissolved lead and dissolved arsenic concentrations have also exceeded their water quality objectives in at least one pond (Brown and Caldwell et al. 2005).

The concentrations in sediment of metals, including arsenic, cadmium, chromium, copper, lead, nickel, selenium, silver and zinc, were evaluated for data collected in the South Bay and the SBSP Restoration area. In general, these metals were detected at concentrations similar to their respective SFRWQCB ambient criteria. Within the SBSP Restoration Project area, the spatial distribution of the detected metal concentrations suggests that there is not a localized metals impact. Also, the sediment data reviewed for the Alviso pond complex indicate metal concentrations similar to those within the surrounding watershed (USFWS and CDFG 2003).

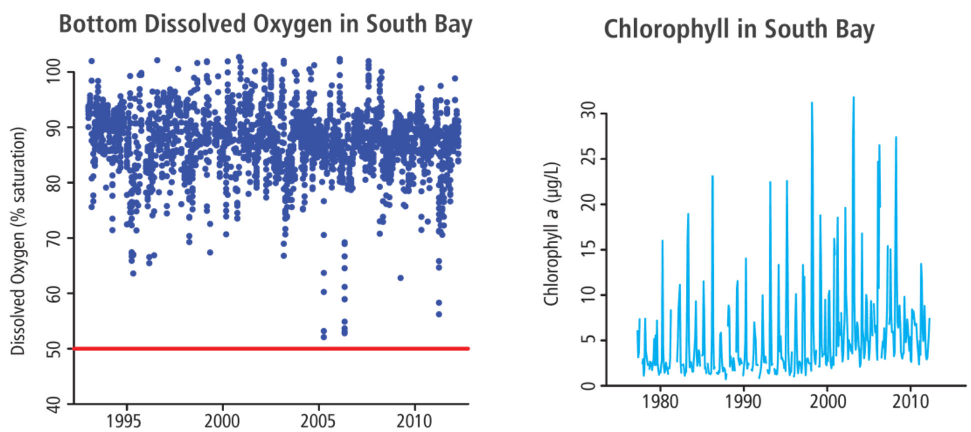
General Water Quality Conditions. Salinity in the South Bay below the Dumbarton Bridge varies with the daily tides and is typically near seawater levels at 28 to 33 parts per thousand (ppt), because the South Bay receives relatively little freshwater inflow except during the wet season, when local stream discharges can cause salinity to decrease to 20 ppt or lower (Schemel et al. 2003; USFWS and CDFG 2003). For more information regarding how hydrodynamics can affect salinity, see Section 3.2, Hydrology, Flood Management, and Infrastructure. Historical salinity concentrations in the salt ponds varied considerably, ranging from as low as the Bay concentration to brines with salinity concentrations several times that of the Bay. More recently, many of the ponds have been operated for limited circulation.

In sloughs and ponds, dissolved oxygen concentrations regularly fluctuate on a daily cycle. Algal growth in salt ponds can cause dissolved oxygen and pH levels to vary significantly over the course of a day. These levels vary because during daylight hours, photosynthesis produces oxygen and consumes dissolved carbon dioxide. At night, respiration produces dissolved carbon dioxide and consumes oxygen. Therefore, any significant algal growth causes dissolved oxygen and pH levels to peak during the late afternoon and to be at their lowest levels before dawn. Diurnal and/or tidal cycling can also influence salinity, pH, temperature, and dissolved oxygen levels.

Diurnal and/or tidal cycling is particularly important for dissolved oxygen, which is influenced by both circulation and respiration of algae. Minimum dissolved oxygen levels in the South Bay as a function of percent saturation (typically recorded at or near the bottom of the water column) and chlorophyll-a concentrations for the South Bay, averaged over the top 10 feet (3 meters) of depth, are shown on Figure 3.3-4a (SFEI 2012). Although dissolved oxygen concentrations in open waters are generally above water quality objectives, sloughs in the South Bay often do not meet the Basin Plan objective of 5.0 milligrams per liter (mg/L).

[1] Bay-wide average taken from SFEI: http://www.sfei.org/data.

Figure 3.3-4a. Dissolved Oxygen and Chlorophyll-a in the South Bay



Source: 2012 Regional Monitoring Program Update, SFEI 2012

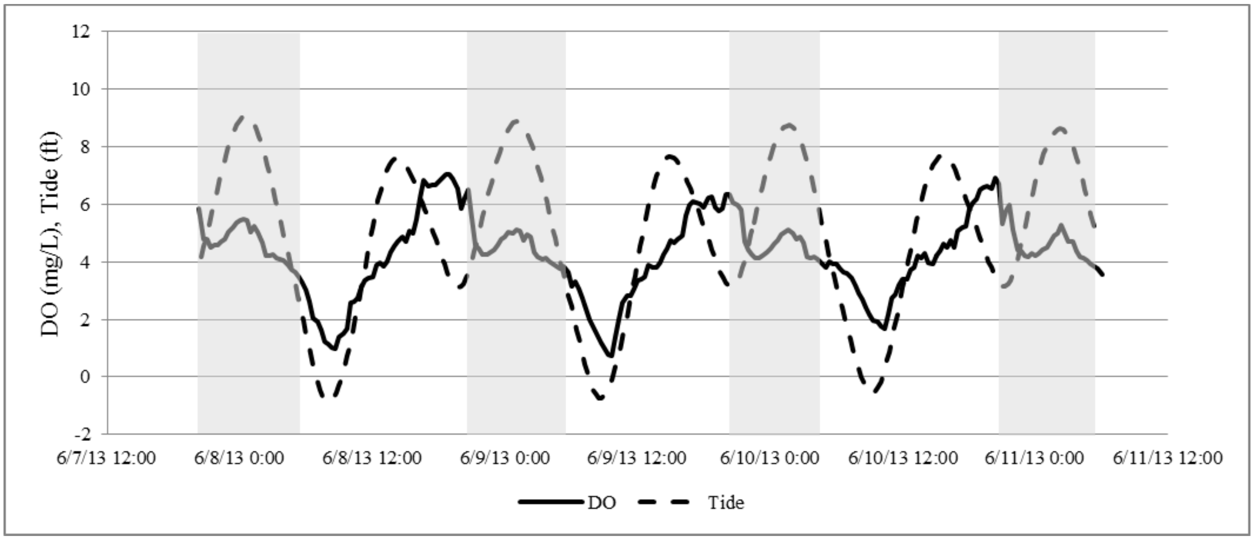
Dissolved oxygen concentrations within former salt ponds have shown significant variations throughout the day. DO levels in shallow salt marshes typically reach their minimum and maximum within 2 hours of sunrise and sunset, respectively. Under ideal conditions, photosynthesis generates DO faster than the system can consume it. The resulting DO surplus becomes depleted as respiration continues through the night (Tyler, Brady et al. 2009). Whether or not the surplus that has accumulated throughout the day is sufficient to prevent a hypoxic event depends on a number of factors, the most influential of which being water temperature and daily solar input (Tyler, Brady et al. 2009). Several researchers have linked hypoxic events to relatively high water temperatures during warmer months (Tyler, Brady et al. 2009). Continuous monitoring of DO in a representative pond in the South Bay was conducted as a part of the AMP. The data show low DO in the late AM when the tide is also low or outgoing (Figure 3.3-4b).

There have been reported occasions when a severe depletion in dissolved oxygen levels in the Alviso pond complex has led to gulls feeding on oxygen-stressed fish or conditions when low dissolved oxygen levels caused fish mortality within the former salt ponds (SFRWQCB 2008).

Continuous monitoring data from within former salt ponds show that pH levels can vary significantly and are often above the Basin Plan objective of 8.5. However, receiving water data have also shown that high pH levels from pond discharges are quickly normalized in nearby sloughs and the Bay (SFRWQCB 2008).

Due to shallow water depths and limited tidal exchange, water temperature in the salt ponds is elevated and varies widely throughout the day. Annual water temperatures within the ponds generally range from 40 to 80 degrees Fahrenheit and generally track air temperature (SFRWQCB 2008).

Figure 3.3-4b. 80-hour plot of DO and Tide Height in pond A21, 6/7/13 to 6/11/13 Spring tide, new moon.



Source: Dissolved Oxygen Levels and Frequent Hypoxia Associated with Restored Tidal Ponds in South San Francisco Bay, La Luz, et, al, 2015, Draft.

Groundwater

This section characterizes the existing physical setting of the South Bay with respect to groundwater. Groundwater can be affected by surface water conditions through surface water/groundwater interactions.

The Santa Clara Valley Groundwater Basin is in the South Bay (DWR 2003). Within this basin, the groundwater subbasins include the Niles Cone, Santa Clara, and San Mateo Plain Subbasins (see Figure 3.3-5). The Alviso pond complex is primarily within the Santa Clara Subbasin, but northeastern ponds are within the Niles Cone Subbasin. The Ravenswood pond complex is within the San Mateo Plain Subbasin.

Historically, groundwater was the major source of water supply for Santa Clara County. Currently the groundwater basin in Santa Clara County is actively managed by the SCVWD, which recharges between 100,000 and 130,000 acre-feet of water per year in a non-drought year. Groundwater extraction is important to the salt ponds because historical over-pumping led to land subsidence. Consequently the bottoms of the ponds have been lowered and need even more sediment accretion to reach marsh plain elevation where marsh plants will thrive.

Local land elevations, particularly in the South Bay, have subsided from their original elevations before historical development, primarily due to the extraction of significant amounts of groundwater. Land subsidence in the South Bay is largely due to agricultural pumping in the early part of the 1900s. Land adjacent to the Bay in Santa Clara Valley was reported to have subsided 2 to 8 feet from 1912 to 1967 (Helley et al. 1979), and up to 13 feet locally (SFRWQCB et al. 2003).

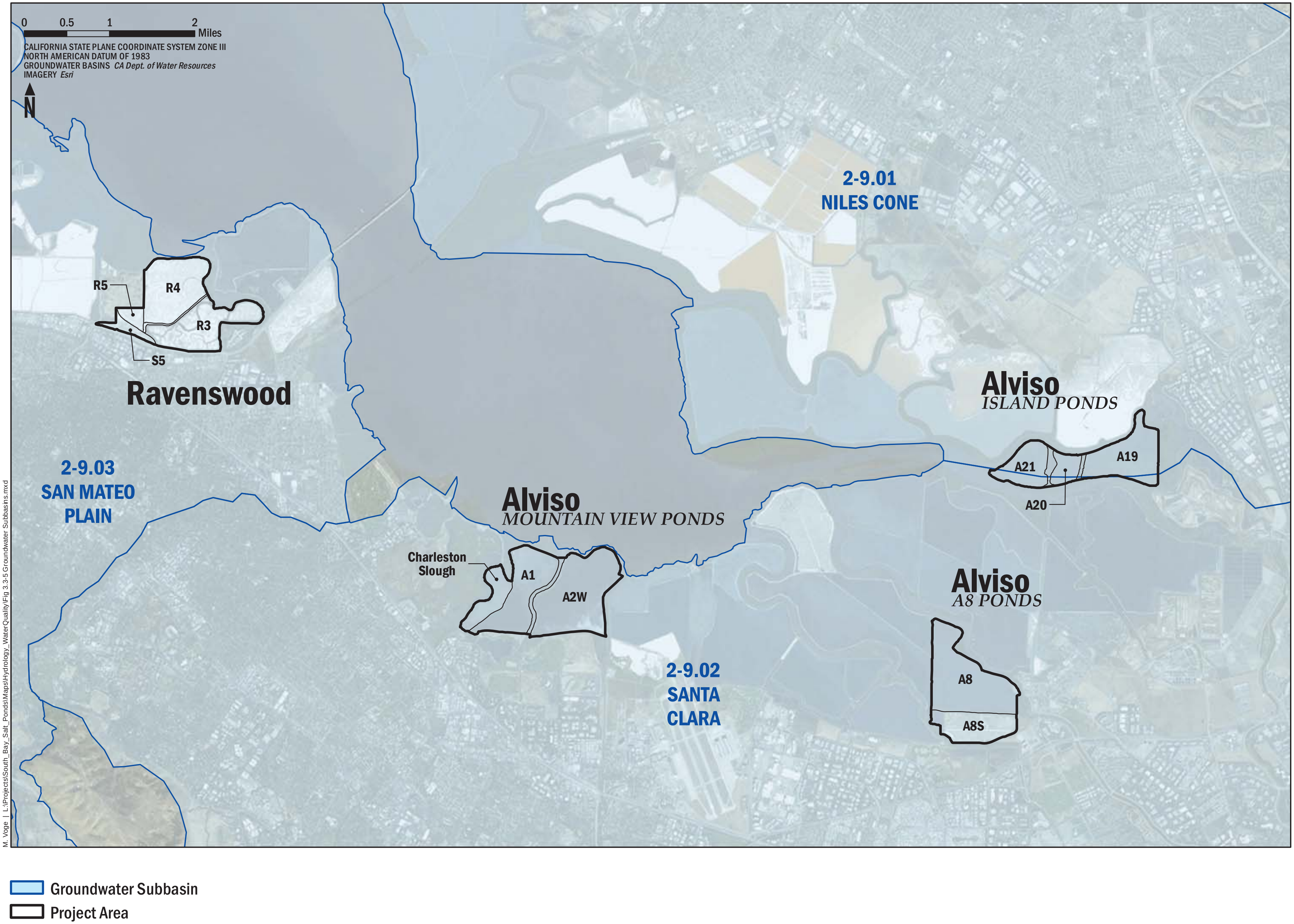


Figure 3.3-5
Groundwater Subbasins

Subsidence was virtually halted by 1971, when groundwater pumping decreased with surface water importation from the State Water Project.[2] Nevertheless, ponds in the Alviso pond complex are subsided due to historic groundwater pumping. In the fourth year of this historic drought (2012-2015), land subsidence is an issue of concern for water management agencies.

Groundwater levels have previously been depleted by withdrawing groundwater at rates faster than it recharges naturally. But groundwater levels have been restored in the past 40 years by regional groundwater management actions, particularly those by the SCVWD. Today, groundwater flow is generally bayward, providing a measure of protection from salinity intrusion (DWR 2003). Groundwater levels for wells within or near the Alviso pond complex indicate that after groundwater levels declined to as much as 100 feet below mean sea-level in the 1960s, water levels recovered due to imported State Water Project surface water. More recent data indicate that shallow wells near the salt ponds have water levels at or near sea level, as would be expected for an aquifer in hydraulic communication with the Bay. Groundwater levels for wells in the Ravenswood pond complex of the San Mateo Subbasin indicate that the horizontal groundwater gradient is eastward toward the Bay (Fio and Leighton 1995), but pumping in some areas west of U.S. Highway 101 (U.S. 101) has drawn water levels below mean sea-level, creating a downward vertical gradient.

Virtually all of the salt ponds are underlain by Holocene bay mud. The bay mud is relatively impermeable to both infiltration and groundwater flow. Bay mud extends to the edge of the Alviso pond complex, and the depths around the edges of the Alviso pond complex range from surface level to as deep as approximately 22 feet below mean sea level (msl) (Tudor Engineering Company 1973). For example, the thickness of bay mud along Alviso Slough and up into the Guadalupe River ranges from approximately 5 to 25 feet below msl, with alluvium overlying some of these areas. Also, the depth of bay mud along Coyote Creek ranges from approximately 2 to 22 feet below sea level, and young alluvium overlies the mud in the upper reaches of Coyote Creek. Other SBSP areas exhibit similar bay mud distribution and thicknesses.

Groundwater Aquifers. Groundwater aquifers in the South Bay include shallow aquifers connected to the Bay and deeper aquifers that are generally isolated from shallow aquifers. An exception to this isolation occurs in the vicinity of Coyote Creek, where the confining layer over the deep aquifer is leaky. The deep aquifers beneath most of the Santa Clara Valley Groundwater Basin are separated from the Bay and shallow ground aquifers (above approximately 100 feet deep) by a combination of bay mud and alluvial layers, which together act as a natural confining layer. This confining layer occupies the northern portion of the Santa Clara Subbasin (at an average depth of 100 to 200 feet) and extends northward beneath the Bay and along its margins on both the east and west sides. This confining layer provides protection from infiltration of saltwater or contaminated groundwater into the deeper water supply aquifers.

Upland areas serve as recharge areas for the Santa Clara Valley Groundwater Basin, where precipitation infiltrates into the soil and percolates to the groundwater table before flowing downgradient toward the natural discharge points at the margins of and beneath the Bay. Under natural conditions before historical development, precipitation and recharge in upland areas and discharge in surface springs and beneath the

[2] SCVWD has a contract for 100,000 acre-feet per year of water from the State Water Project, delivered via the Harvey O. Banks Pumping Plant in the southern delta and the South Bay Aqueduct.

Bay was sufficient to prevent the infiltration of surface water from the Bay (DWR 2003). It is when these natural conditions were altered by groundwater extraction that historical saltwater intrusion occurred.[3]

Groundwater levels have previously been depleted by overpumping, but groundwater levels have been restored within the past 40 years by regional groundwater management actions, including those by the SCVWD. Today, flow is generally bayward, providing a measure of protection from salinity intrusion (DWR 2003). Groundwater levels for wells within or near the Alviso pond complex indicate that after groundwater levels declined to as much as 100 feet below msl in the 1960s, water levels recovered due to imported State Water Project surface water. More recent data indicate that shallow wells in and near the salt ponds have water levels at or near sea level, as would be expected for an aquifer in hydraulic communication with the Bay. Groundwater levels for wells in the Ravenswood pond complex of the San Mateo Subbasin indicate that the horizontal groundwater gradient is eastward toward the Bay (Fio and Leighton 1995), but pumping in some areas west of U.S. Highway 101 (U.S. 101) has drawn water levels below msl, creating a downward vertical gradient.

Local land elevations, particularly in the South Bay, have subsided from their original elevations before historical development, primarily due to the extraction of significant amounts of groundwater. Land subsidence in the South Bay is largely due to agricultural pumping in the early part of the 1900s. Land adjacent to the Bay in Santa Clara Valley was reported to have subsided 2 to 8 feet from 1912 to 1967 (Helley et al. 1979), and up to 13 feet locally (SFRWQCB et al. 2003). Subsidence was virtually halted by 1971, when groundwater pumping decreased with surface water importation from the State Water Project.[4] Nevertheless, ponds in the Alviso pond complex are subsided due to historic groundwater pumping.

Groundwater Quality. Groundwater quality in the Santa Clara Valley Subbasin is generally high; however, some areas in the northern portion of the subbasin have high mineral content, and some areas in the southern basin have elevated nitrate concentrations (DWR 2003). Also, a number of groundwater contaminant plumes (primarily fuels and chlorinated solvents) are present locally. According to SCVWD and SFRWQCB data (SFRWQCB et al. 2003), the plumes are generally at least a mile from the salt ponds.

The Saltwater Intrusion Investigation by the SCVWD indicated the maximum areal extent of saltwater intrusion (as indicated by chloride concentrations above 100 ppm) by the mid-1970s was as far southeast as the intersection of U.S. 101 and Interstate Highway 880 (I-880). The salinity intrusion was apparently driven by the movement of saline waters from the Bay up the Guadalupe River and Coyote Creek, during high tides and low stream flow. Salinity intrusion from the waterways was exacerbated by subsidence and dredging. The Bay muds were shown to be leaky and to allow for downward migration of salinity into the upper aquifer zone. High salinity was also present in the lower aquifer zone beneath San Jose along the Guadalupe River and in the Palo Alto area. SCVWD data indicate that salinity remains elevated in the upper aquifer as much as 5 to 6 miles inland (southeast) of the salt ponds along the Guadalupe River and Coyote Creek.

Groundwater monitoring data in the Alviso pond complex from SCVWD’s Salinity Intrusion Monitoring Program indicate elevated salinity levels in shallow wells (screened above 100 feet below msl) within and

[3] Saltwater intrusion is characterized by the movement of saline water into a freshwater aquifer. Groundwater pumping can reduce or reverse seaward flow, causing seawater to enter and penetrate inland aquifers.
[4] SCVWD has a contract for 100,000 acre-feet per year of water from the State Water Project, delivered via the Harvey O. Banks Pumping Plant in the southern delta and the South Bay Aqueduct.

near the salt ponds. For example, data at the well cluster on Alviso Slough near the boundary between Ponds A7 and A8 indicate very low chloride concentrations in the two wells screened below 250 feet msl, but high chloride concentrations in the shallow aquifer zone (19,500 mg/L).

Groundwater quality data are limited in the San Mateo Subbasin (including the Ravenswood pond complex) because there is no groundwater management agency in the San Mateo Subbasin and hence no groundwater monitoring. Salinity intrusion was a historic problem in the basin in the mid-1900s, and most municipal wellfields were abandoned with the delivery of imported surface water. Groundwater conditions similar to those in and adjacent to the other pond complexes were assumed, with elevated salinity in the shallow aquifer zone.

Project Setting

Alviso-Island Ponds

The Alviso-Island pond cluster is at the southeastern extent of the Bay near Coyote Creek. Tidal flows were restored to these ponds in March 2006 as part of the tidal marsh restoration actions implemented under the ISP. Five breaches were cut along the south side of the ponds to allow full tidal inundation. This restoration approach is a minimally engineered, passive design that relies on the natural sedimentation processes to restore the ponds to tidal marsh habitat. The overall restoration goal is to reestablish vegetation, promote recolonization by benthic organisms, and provide habitat for various wildlife species.

Breaching these ponds has facilitated sediment accretion within the ponds. Sediment has accumulated relatively rapidly within the ponds since levee breaching (approximately twice as fast as typical marshes), and concurrently sediment has accumulated on adjacent mudflats on Coyote Creek and Mud Slough. The pond nearest the Bay, Pond A21 has filled in the fastest. Within five years, vegetation is well-established and a range of birds and fish are using it for habitat. The second pond from the Bay, Pond A20 is beginning to vegetate. The third pond, Pond A19 has changed the least. At the Island Ponds, proximity to the Bay seems to be an important factor for accretion, but other factors such as starting elevation and circulation are also key contributors to sedimentation rates.

Large-scale erosion of the adjacent mudflats and tidal marshes has not been observed (Callaway et al. 2013). The increased sediment demand is likely to have been met by local tributaries, sediment influx from the Bay, and/or from other nearby sediment sources. Sediment concentrations in the Island Ponds are expected to be similar to concentrations found in suspended sediments of the lower South Bay.

Total mercury and methylmercury concentrations were analyzed in sediment cores from Ponds A19, A20, and A21 collected in the winter of 2004, before breaching the Island Ponds. Total mercury concentrations ranged from 0.11 to 0.25 mg/kg, which is similar to or less than average concentrations in the Bay. Methylmercury concentrations ranged from 0.68 to 1.69 µg/kg, which is similar to or greater than concentrations in surrounding areas in the lower South Bay (Grenier, L, 2010).

Alviso-Mountain View Ponds

The Alviso-Mountain View pond cluster, in the western portion of the Alviso pond complex, includes Ponds A1 and A2W and the City of Mountain View's Charleston Slough. The Mountain View Ponds are currently operated for limited directional circulation through Ponds A1 and A2W. There is a 48-inch intake structure in Pond A1, a 72-inch siphon between Ponds A1 and A2W, and an 48-inch outlet structure to the Bay from Pond A2W (see Figure 3.2-3 in Section 3.2, Hydrology, Flood Management, and Infrastructure). The water circulation system is operated to control dissolved oxygen problems and associated odors in these ponds. The sediment concentrations in these ponds are expected to be similar to or less than the concentrations found in suspended sediments of the lower South Bay.

Charleston Slough is a muted tidal system. A levee and a large, two-way tide gate were constructed across the outer end of the slough several decades ago. At the landward side of the slough (at the Coast Casey Forebay), the City of Mountain View has a water intake system to supply almost 10 million gallons per day of water to Shoreline Park's sailing lake. The lake's outflow is into Permanente Creek (which connects to Mountain View Slough). Within the largely contained, leveed portion of Charleston Slough, there is a main channel connecting the tide gate to the pump intake; this channel is thought to be maintained by the pumping itself. The rest of the inner slough is muted tidal mudflat.

Total mercury and methylmercury concentrations were analyzed in sediment cores from Ponds A1 and A2W collected in late summer or fall of 2004. Total mercury concentrations ranged from 0.30 to 0.31 mg/kg, which is greater than average concentrations found in the Bay. Methylmercury concentrations ranged from 0.32 to 2.54 µg/kg, which is both less than and greater than the concentrations in other parts of the surrounding areas in the lower South Bay (USGS 2005).

Alviso-A8 Ponds

The Alviso-A8 pond cluster is within the Alviso pond complex between Alviso and Guadalupe Sloughs in the lower South Bay. The A8 pond system is operated to maintain muted tidal circulation through Ponds A5, A7, A8, and A8S. The Pond A8 reversible, variable-sized notch was installed as part of Phase 1 actions, and extensive mercury studies in and around Pond A8 and adjacent sloughs have been conducted at the notch as part of the adaptive management actions.

The SBSP Restoration Project has monitored salinity, pH, temperature, and dissolved oxygen at the discharge notch in the Pond 8 levee and in the surrounding sloughs after implementation of the Phase 1 improvements. Average salinity concentrations at the notch ranged from approximately 7 to 14 ppt during the 2011 spring and summer monitoring period and were comparable to near-bottom concentrations found in Alviso Slough. Average pH concentrations ranged from 7.9 to 9.1 pH units, and average dissolved oxygen concentrations ranged from about 2.4 to 14.0 mg/L during that same period (USFWS and USGS 2012). Salinity levels in the Pond A5, A7, A8 system decreased in 2011 after the Pond A8 notch was opened (relative to the 2010 values). Dissolved organic carbon, total suspended solids (TSS), and particulate organic carbon concentrations also decreased (Ackerman, J.T., et.al., 2013).

Monitoring for the South Baylands Mercury Project (2006–2007) has found total mercury concentrations in Pond A8's water ranging from 7 to 230 ng/L and methylmercury concentrations ranging from 0.25 to 10.2 ng/L before installation of the Pond A8 notch. The average total mercury concentration in Pond A8 was greater than the average concentrations found in Alviso Slough and Alviso Marsh (60 ± 10 ng/L compared to 23 ± 4 ng/L and 21 ± 4 ng/L, respectively). The average methylmercury concentration in Pond A8 was substantially greater than the average concentrations found in Alviso Slough and Alviso Marsh (2.88 ± 0.44 ng/L compared to 0.38 ± 0.11 ng/L and 0.52 ± 0.24 ng/L) (Grenier et al. 2010). Sediment concentrations of methylmercury in Pond A8 were generally found to be greater than the methylmercury concentrations in Alviso Slough and Alviso Marsh (Grenier et al. 2010; Marvin-DiPasquale 2013). This study also found that the bioavailability and bioaccumulation of mercury was greater in Pond A8 than in either Alviso Slough or the fringing tidal marsh around the slough channel and the A8 Ponds. Methylmercury concentrations in water and sediment were greater in Pond A8 than in

Alviso Slough or its fringing tidal marsh channels, and biosentinels representing benthic and shoreline habitats indicated more mercury bioaccumulation in Pond A8 than in the tidal marshes along Alviso Slough (Grenier et al. 2010).

The SBSP Restoration Project's science team summarized the results of the recent monitoring of the A8 Ponds and surrounding waterways conducted as a part of the AMP (Valoppi, L., 2015). The results of the 2013 study found that Forster's tern egg mercury concentrations decreased by 59 percent between 2011 and 2013 at restored ponds, compared to a decline of 23 percent between these years at reference ponds. The end result of this 3-year comparison was that tern egg mercury concentrations decreased between 2010 and 2013 by 31 percent at both restored ponds and reference ponds. Despite the dramatic increase observed right after Pond A8 was opened in 2011 and correspondingly large decrease (2011 to 2013) in tern egg mercury concentrations at the restored ponds, tern egg mercury concentrations in the restored ponds are currently at levels that are similar to what would have been expected without the restoration actions. Results from the collection of slough fish for mercury analysis in 2013 did not appear to show major increases in sentinel slough fish mercury concentrations in relation to the opening of the Pond A8 notch to triple its previous volume (2011 = 1 gate [5 feet]; 2013 = 3 gates [15 feet]). Bathymetric survey data from 2010 to November 2013 showed continued erosion and deposition occurring, with a net scour of about 16 cm throughout the slough. Mercury remobilization occurred mostly near the Pond A6 breaches, but also some mercury is being remobilized near Pond A8. Researchers estimate that, between 2010 and November 2013, between 21 to 24 kilograms (kg) of total mercury have been remobilized in Alviso Slough with up to three gates open, compared to a previously predicted amount of 66 kg of total mercury released with four gates open (20 feet). The SBSP Restoration Project is working with researchers to develop an Alviso Slough scour model to help understand the main causes of slough scour and mercury remobilization.

Results from 2014 and 2015 mercury studies found similar trends as in 2013. The results of the 2014 study found that bird egg mercury concentrations were about the same levels as were observed in 2013, at levels expected had the restoration actions not occurred. Tern eggs results from 2015 also found mercury levels similar between restored and reference ponds, though both sites had increased mercury levels above 2013 and 2014. The increase is due to the normal variability in mercury levels from year to year and not due to restoration or management actions. Similarly, pond and slough fish mercury levels were also variable, but levels in 2014 and 2015 were what would be expected had the restoration actions not occurred. Water samples of mercury in the pond and sloughs supported the conclusions from the fish sampling. So in summary, opening Pond A8 gates from 1 in 2011 to 5 in 2014/5 resulted in no appreciable net increase in mercury levels in birds or fish (Valoppi 2016).

Total mercury concentrations were analyzed in the sediment cores collected in Alviso Slough in May 2012. With the exception of the sediments near the bayward side of Pond A6, total mercury concentrations in the upper 80 centimeters of Alviso Slough sediments were generally greater than the average concentrations in the lower South Bay. Alviso Slough sediments near the Pond A8 notch ranged from 0.6 to 1.0 mg/kg of total mercury in the upper 60 centimeters of the sediment cores. Upstream areas of Alviso Slough were found to have concentrations of up to 3.25 mg/kg (Marvin-DiPasquale 2013).

Alviso Slough scour results in 2014/5 show that even with opening the gates early, there was not appreciably more erosion in Alviso Slough. Overall, there are some areas of deposition in the slough not previously observed, likely due to redistribution of sediments in the channel. Most of the erosion continues to be associated with the Pond A6 breaches, not the opening of the gates at the Pond A8 notch. For the first time gates were open in winter in 2014, and more erosion in the upper part of slough and rest of slough from April 2014 to April 2015 were observed. But from April 2015 to Oct 2015, deposition in slough in Spring and Summer occurred, even though all 5 gates were open. From 2010 to October 2015 about 35kg to 39 kg total Hg remobilized over the entire length of slough with about ~64 % from the zone near the A6 breaches. About 1/3 of the total is immediately near A6 breaches. The smallest Hg remobilization amount is near the A8 notch (5-10%). Preliminary results of a slough scour model support that even opening all 8 gates would have limited impact over the short term on scour in Alviso Slough above the Pond A6 breaches (Valoppi 2016).

Ravenswood Ponds

The Ravenswood pond cluster (Ponds R3, R4, R5, and S5) are operated as seasonal ponds. Seasonal ponds are passively managed; they receive direct precipitation, groundwater inflows, and minimal overland runoff during the wet season. During the dry season, the ponds are allowed to dry out by seepage and evaporation and are thus dry salt pannes for more than half of the year. However, the borrow ditches and historic slough traces do retain water. Salinities and metal concentrations in sediments and in the ditches and slough traces are expected to be elevated in comparison to concentrations in open Bay water because of concentration by evaporation. The dry salt pannes in Ponds R3 and R4 are good nesting habitat for the western snowy plover (*Charadrius nivosus nivosus*), which prefers relatively remote beaches, gravel beds, or other unvegetated terrain.

Total mercury and methylmercury concentrations were analyzed in sediment cores from Pond R4 collected in late summer or fall of 2003. Total mercury concentrations averaged 0.05 mg/kg, which is lower than typical concentrations found in the Bay. Methylmercury concentrations averaged 0.37 µg/kg, which is also less than concentrations generally found in the Bay (USGS 2005).

3.3.2 Regulatory Setting

Regulatory Authorities and Enabling Legislation

Federal and state agencies are authorized to ensure adequate surface water, sediment, and groundwater quality with respect to potential restoration impacts. The agencies, their enabling legislation, and their roles in establishing and implementing policies are described below.

The United States Environmental Protection Agency (USEPA) carries out the mandates set forth in federal Clean Water Act (CWA). The CWA requires that waters of the United States be protected by adopting and implementing a program of water quality standards. Water quality standards consist of defined beneficial uses of water and numeric or narrative criteria to protect those beneficial uses. The USEPA is authorized to delegate its authority to state agencies. In situations where a state fails to carry out the mandates of the CWA by enacting policies and regulations, the USEPA is authorized to promulgate federal regulations by which the state must abide. This federal-state relationship is the basis for USEPA's promulgation of the California Toxics Rule (CTR), which establishes numeric criteria for toxic pollutants.

In California, the State Water Resources Control Board (SWRCB) is the lead agency with delegated authority to implement the CWA. The SWRCB's authority is enabled by California's Porter-Cologne Water Quality Control Act (Porter-Cologne). The SWRCB is responsible for implementing statewide water quality standards programs. The SWRCB has delegated many duties to the nine Regional Water Quality Control Boards (RWQCBs), which are defined by distinct hydrologic regions. The SBSP Project

Restoration area is within the jurisdiction of the SFRWQCB. The SFRWQCB is responsible for developing the water quality standards that are adopted in the Water Quality Control Plan for San Francisco Bay (Basin Plan) after following the scientific and public review procedures set forth in Porter-Cologne Sections 13240–13245. The Basin Plan lists the beneficial uses of water and the water quality objectives [5] to protect those beneficial uses. The beneficial uses and water quality objectives are described below under "Existing Water Quality Standards Programs."

The Basin Plan also includes a plan of implementation that guides the SFRWQCB in carrying out its duties. Those duties include:

- Issuing National Pollutant Discharge Elimination System (NPDES) permits, as authorized by CWA Section 402, to regulate discharges to navigable waters of the United States and their tributaries;
- Issuing state waste discharge requirements, as authorized by Porter-Cologne Sections 13260–13274, to regulate discharges to land and other discharges not requiring federal NPDES permits;
- Issuing water quality certifications as authorized by CWA Section 401 to projects with a federal component that may affect water quality, such as dredging and filling activities that require a CWA Section 404 certification from the United States Army Corps of Engineers;
- Issuing conditioned waivers of waste discharge requirements, as authorized by Porter-Cologne Section 13269, for discharges and other activities that are not considered to threaten the beneficial uses of waters;
- Requiring monitoring data from permitted dischargers, as authorized by Porter-Cologne Sections 13225-c and 13267; and
- Conducting enforcement, as authorized by Porter-Cologne Sections 13300–13365, against parties that fail to apply for necessary permits or comply with existing permits and requirements.

The SFRWQCB also participates in many regional collaborative programs to monitor water quality and implement projects to protect and improve water quality. Examples of such collaborations include the San Francisco Bay RMP, the San Francisco Bay Area Wetlands Regional Monitoring Program, the San Francisco Bay Clean Estuary Partnership, and the SWRCB's Surface Waters Ambient Monitoring Program. The SFRWQCB is also responsible for administering water-quality-related state grant programs. Although these programs are outside of the core regulatory duties of the SFRWQCB, they are important resources for the monitoring and adaptive management phase of the SBSP Restoration Project.

There are two publicly owned water districts responsible for groundwater resources in the SBSP Restoration Project area: Alameda County Water District and SCVWD.[6] Both of these agencies carry out their missions by operating groundwater recharge facilities, conducting monitoring at guard wells, ensuring that unused wells are properly abandoned, and encouraging water conservation by municipalities in their respective service areas.

[5] The distinction between objectives and criteria is important, as federal criteria are viewed as guidelines to be considered, whereas state-adopted objectives have force of law.
[6] Although there are public and private water agencies in San Mateo County, there is no groundwater management agency for the San Mateo Plain Subbasin (including the Ravenswood area).

In addition to protecting water supplies, the SCVWD is also charged with flood protection and stream stewardship. SCVWD flood protection projects are discussed in more detail in Section 3.2, Hydrology, Flood Management, and Infrastructure. The SCVWD stream stewardship mission is carried out through all of its operations, including the Clean Safe Creeks and Natural Flood Protection Program. This program is funded through a 15-year voter-approved benefits assessment. The program is designed to protect property from flooding; ensure that streams and creeks are kept clean; protect and enhance the ecosystem function of streams; and provide open spaces, parks, and trails along streams and creeks in the Santa Clara Valley. Implementation of program elements by SCVWD would improve the quality of freshwater upstream of the SBSP Restoration Project area.

The responsibility for protection of stormwater quality is assigned to the countywide stormwater programs in the SBSP Restoration Project area. The Santa Clara Valley Urban Runoff Pollution Prevention Program is a multi-agency program representing 14 municipal government co-permittees and the SCVWD. The Alameda Countywide Clean Water Program represents 15 municipal government co-permittees, the Alameda County Flood Control and Water Conservation District, and the Zone 7 Water Agency. Both of these stormwater programs implement stormwater quality management plans with regulatory oversight from the SFRWQCB. The stormwater quality management plans describe a coordinated program of monitoring, watershed assessment, inspections, illicit discharge control, construction controls, municipal maintenance, and public education.

Three publicly owned treatment works discharge highly treated water to shallow waters in the lower South Bay. In the vicinity of the Alviso pond complex, the San Jose/Santa Clara Water Pollution Control Plant discharges to Artesian Slough. The Sunnyvale Water Pollution Control Plant discharges to Moffett Channel, which discharges to Guadalupe Slough. The Palo Alto Regional Water Quality Control Plant discharges to a mudflat to the south of the Ravenswood pond complex. All three of these plants produce water treated to a sufficient quality to allow water recycling for irrigation and other uses. In the northern area of the South Bay, the East Bay Dischargers Authority operates a deep-water outfall in the Bay that discharges secondary-treated effluent from four different municipal treatment plants. Also, the Union Sanitary District operates a treatment wetland to the north of the Eden Landing pond complex. All of these municipal dischargers operate under NPDES permits issued and enforced by the SFRWQCB. Although there are no industrial dischargers in the South Bay, there are numerous ongoing cleanup operations in the region that extract groundwater, remove pollutants (primarily fuels and organic solvents), and discharge the treated groundwater under coverage by the NPDES general permit for groundwater discharge administered by the SFRWQCB. Periodic spills of toxic materials (e.g., brines, chemicals) are subject to enforcement by the SFRWQCB.

The California Department of Toxic Substances Control (DTSC) regulates hazardous wastes. It derives its authority from Title 22 of the California Code of Regulations. Any areas known to have hazardous wastes in need of remediation near the SBSP Restoration Project area would be listed in the DTSC Envirostar database (http://www.envirostor.dtsc.ca.gov/public/).

Existing Water Quality Standards Programs

San Francisco Bay Region Basin Plan and California Toxic Rule

The existing water quality standards program implemented by the SFRWQCB is defined in the Basin Plan. The Basin Plan lists numerous beneficial uses of water that apply in the project and regional setting. The most relevant beneficial uses are ocean, commercial, and sport fishing; estuarine habitat; industrial service supply; fish migration; navigation; preservation of rare and endangered species; contact and non-contact recreation; shellfish harvesting; spawning; reproduction and/or early development of fish; and wildlife habitat. Designated groundwater beneficial uses include municipal and domestic supply, agricultural supply, and industrial service supply.

To protect these beneficial uses, the Basin Plan lists both narrative and numeric water quality objectives for surface and groundwater. Narrative objectives provide general guidance to avoid adverse water quality impacts. Narrative objectives relevant to this analysis include salinity, sediment (i.e., TSS), sulfides, toxicity, biostimulatory substances, bioaccumulation, and population and community ecology. Those narrative objectives are listed in Table 3.3-1. Numeric water quality criteria included in the Basin Plan establish objectives for trace metals, dissolved oxygen, turbidity, temperature, pH, bacteriological pathogens, and un-ionized ammonia. Numeric water quality criteria are summarized in Tables 3.3-2 to 3.3-4.

The Basin Plan amendment for copper and nickel (adopted in June 2007) specifies site-specific objectives for copper in the Bay and site-specific objectives for nickel in the South Bay, as shown in Table 3.3-2. The implementation plan establishes copper control measures to prevent increases in ambient dissolved copper concentrations, and metal translators are used to provide a ratio for total to dissolved copper and nickel concentrations for segments of the Bay.

Table 3.3-1 Basin Plan Narrative Water Quality Objectives Relevant to this Analysis

OBJECTIVE	NARRATIVE
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. There shall be no acute toxicity in ambient waters. Acute toxicity is defined as a median of less than 90 percent survival, or less than 70 percent survival, 10 percent of the time, of test organisms in a 96-hour static or continuous flow test. There shall be no chronic toxicity in ambient waters. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. Chronic toxicity generally results from exposures to pollutants exceeding 96 hours. However, chronic toxicity may also be detected through short-term exposure of critical life stages of organisms. As a minimum, compliance will be evaluated using the bioassay requirements contained in Chapter 4 [of the Basin Plan]. The health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ substantially from those for the same waters in areas unaffected by controllable water quality factors.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU [nephelometric turbidity units].
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.
Suspended material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Settleable solids	Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.

Table 3.3-1 Basin Plan Narrative Water Quality Objectives Relevant to this Analysis

OBJECTIVE	NARRATIVE
Floating material	Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Salinity	Controllable water quality factors shall not increase the total dissolved solids or salinity of waters of the state so as to adversely affect beneficial uses, particularly fish migration and estuarine habitat.
Sulfides	All water shall be free from dissolved sulfide concentrations above natural background levels. Sulfide occurs in Bay muds as a result of bacterial action on organic matter in an anaerobic environment. Concentrations of only a few hundredths of a milligram per liter can cause a noticeable odor or be toxic to aquatic life. Violation of the sulfide objective will reflect violation of dissolved oxygen objectives as sulfides cannot exist to a significant degree in an oxygenated environment.
Oil and grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.
Biostimulatory substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses. Changes in chlorophyll-a and associated phytoplankton communities follow complex dynamics that are sometimes associated with a discharge of biostimulatory substances. Irregular and extreme levels of chlorophyll-a or phytoplankton blooms may indicate exceedance of this objective and require investigation.
Bioaccumulation	Many pollutants can accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.
Population and community ecology	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ substantially from those for the same waters in areas unaffected by controllable water quality factors.
Dissolved oxygen	For all tidal waters, the following objectives shall apply in the Bay: Downstream of Carquinez Bridge 5.0 mg/L minimum Upstream of Carquinez Bridge 7.0 mg/L minimum For nontidal waters, the following objectives shall apply to waters designated as: Cold water habitat 7.0 mg/L minimum Warm water habitat 5.0 mg/L minimum The median dissolved oxygen concentration for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation. Dissolved oxygen is a general index of the state of the health of receiving waters. Although minimum concentrations of 5 mg/L and 7 mg/L are frequently used as objectives to protect fish life, higher concentrations are generally desirable to protect sensitive aquatic forms. In areas unaffected by waste discharges, a level of about 85 percent of oxygen saturation exists. A three-month median objective of 80 percent of oxygen saturation allows for some degradation from this level, but still requires a consistently high oxygen content in the receiving water.

Table 3.3-2 **Basin Plan Surface Water Objectives for Metals (µg/L)**

	WATER QUALITY OBJECTIVE SOUTH OF HAYWARD SHOALS		WATER QUALITY OBJECTIVE NORTH OF HAYWARD SHOALS	
	CONTINUOUS (4-DAY AVERAGE)	MAXIMUM (1-HOUR AVERAGE)	CONTINUOUS (4-DAY AVERAGE)	MAXIMUM (1-HOUR AVERAGE)
Arsenic	36	69	36	69
Cadmium	9.3	42	9.3	42

	WATER QUALITY OBJECTIVE SOUTH OF HAYWARD SHOALS		WATER QUALITY OBJECTIVE NORTH OF HAYWARD SHOALS	
	CONTINUOUS (4-DAY AVERAGE)	MAXIMUM (1-HOUR AVERAGE)	CONTINUOUS (4-DAY AVERAGE)	MAXIMUM (1-HOUR AVERAGE)
Chromium	50	1100	50	1100
Copper	6.9	10.8	6.0	9.4
Lead	8.1	210	8.1	210
Nickel	11.9 [1]	62.4 [1]	8.2	74
Selenium (total recoverable)	5	20	5	20
Silver	—	1.9	—	1.9
Zinc	81	90	81	90

[1] Lower South Bay (south of Dumbarton Bridge)
Hayward Shoals = Little Coyote Point to the Oakland Airport

Table 3.3-3 Other Numeric Surface Water Criteria

PARAMETER	EVALUATION CRITERIA
Dissolved oxygen	5 mg/L [1, 5]
Mercury (total, including organic compounds)	0.051 µg/L, [2, 6] see also Table 3.3-4, below
PCBs	0.17 ng/L [2, 7]
PAHs	15.0 µg/L [1, 8]
Dioxins and furans	0.014 picogram (pg)/L [3, 9]
Chlordanes	2.2 ng/L [2]
DDTs	0.59 ng/L [2]
TPH-diesel	200 mg/L [4]

Notes:
1 SFRWQCB, Water Quality Control Plan, San Francisco Bay Basin. Surface waters greater than 10 ppt salinity.
2 40 CFR Part 131.38 (California Toxics Rule [CTR]), May 18, 2000.
3 National Recommended Water Quality Criteria – Correction, USEPA, April 1999.
4 USEPA Multi-Sector Permit Benchmark Values.
5 Dissolved oxygen = water quality objective for tidal waters downstream of Carquinez Bridge.
6 Mercury = 0.051 µg/L, 30-day average (CTR). Applies south of Dumbarton Bridge.
7 PCB = 30-day average, water quality criteria value for human health for consumption of organisms, 10^{-6} risk.
8 PAH = water quality objective for 24-hour averaged level, salinity over 10 ppt.
9 Dioxins and furans = water quality criteria value for human health for consumption of organisms, 10^{-6} risk.

Table 3.3-4 Numeric Criteria for Mercury

TOTAL MERCURY WATER QUALITY OBJECTIVES		
LOCATION	WATER QUALITY OBJECTIVE FOR TOTAL MERCURY	SOURCE
San Francisco Bay	2.1 µg/L 1-hour average in water	Basin Plan
	0.2 mg/kg in fish, trophic level 3 and 4 (larger fish which humans consume)	Basin Plan
	0.03 mg/kg in fish, 3 to 5 cm in length (smaller fish which wildlife consumes)	Basin Plan
South of the Dumbarton Bridge	0.051 µg/L 30-day average in water	CTR objective (applies in addition to the three Basin Plan objectives)
Notes: Both the current and proposed Basin Plan objectives listed above are applicable in marine waters— those in which the salinity is equal to or greater than 10 ppt 95 percent of the time. For waters in which the salinity is between fresh and marine, that is between 1 and 10 ppt, the applicable objectives are the more stringent of the freshwater or marine objectives. For mercury, the marine objectives are more stringent.		

The Basin Plan amendment adopting the Bay Total Maximum Daily Load (TMDL) for mercury (approved in February 2008) includes numeric water quality objectives for mercury concentrations in fish. Although water quality criteria and objectives are traditionally expressed as mass of pollutant per unit mass of water (e.g., µg/L), the Clean Water Act enables expression of criteria and objectives in alternative units. For bioaccumulative pollutants such as mercury, guidance by USEPA requires states to develop numeric criteria or objectives that are based on pollutant concentrations in fish tissue and then implement the tissue-based criteria or objectives by translating the tissue-based values to water-based and sediment-based metrics. The fish tissue TMDL targets for the Bay mercury TMDL are 0.2 mg/kg for trophic level 3 and trophic level 4 fish, and 0.03 mg/kg for smaller fish (3 to 5 centimeters in length) that are the prey of wildlife. These objectives are summarized in Table 3.3-4. To achieve the human health and wildlife targets and to attain water quality standards, the Bay-wide suspended sediment mercury concentration target was set at 0.2 mg/kg mercury in dry sediment. (This does not translate directly to a numeric guideline for sediments within the SBSP Restoration Project area. Rather, the evaluation of impacts considers the potential of a project activity to raise or lower the average concentration of mercury in the Bay near where the activity takes place.)

The Basin Plan amendment adopting the TMDL for PCBs in the Bay (approved in March 2010) includes a fish tissue concentration target that is used to protect beneficial uses. A sediment concentration goal of 1 µg/kg PCBs is used to support the fish tissue target of 10 µg/kg wet weight. Currently, ambient Bay sediments are approximately ten-fold higher than the sediment concentration goal of 1 µg/kg. The impact of project activities on the concentration of PCBs in ambient Bay sediments has been evaluated with reference to this goal and other environmental indicators of ecological risk, as appropriate.

In addition to the Basin Plan, the CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to all inland surface waters and enclosed bays and estuaries of the San Francisco Bay region, although Tables 3-3 and 3-4 of the Basin Plan include numeric water quality objectives for certain of these priority toxic pollutants that supersede the CTR criteria (except south of the Dumbarton Bridge). Human health criteria are further identified as for consumption of “water and organisms” and “organisms only.” These objectives are applied with consideration to the beneficial use of the waterbody.

Applicable objectives are affected by both geography and salinity. Numeric and narrative objectives from the Basin Plan and most CTR numeric criteria apply to Bay waters. The Basin Plan and the CTR also establish different numeric objectives for freshwater and saltwater. Freshwater is defined as having salinity less than 1 ppt more than 95 percent of the time, whereas saltwater is defined as having salinity greater than 10 ppt more than 95 percent of the time. Conditions between these two endpoints define estuarine waters, in which case the more stringent (lower) of either the freshwater or the saltwater objectives apply.

SWRCB Sediment Quality Objectives

The SWRCB sediment quality objectives are based on chemical concentrations, bioassays, and benthic community conditions. The *Water Quality Control Plan for Enclosed Bays and Estuaries*, Part 1, *Sediment Quality* (SWRCB 2009) contains the following narrative water quality objective: “Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities in bays and estuaries of California.” This Water Quality Control Plan became effective in August 2009, supersedes other narrative sediment quality objectives, and establishes new sediment quality objectives and related implementation provisions for specifically defined sediments in most bays and estuaries.

LTMS Guidelines

There is guidance for sediment assessment in the Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (San Francisco Bay Long-Term Management Strategy (LTMS) Guidelines; SFRWQCB 2000). The LTMS Guidelines define statistically determined San Francisco Bay ambient sediment concentrations and ecological thresholds (Table 3.3-5). The ambient concentrations are established through previous sampling efforts around “unimpacted” areas of San Francisco Bay. The ecological thresholds defined in the LTMS Guidelines are the Effects Range–Low (ER-L) and the Effects Range–Median (ER-M) established by the National Oceanic and Atmospheric Administration (NOAA). ER-Ls represent the concentration below which adverse biological effects are unlikely, and ER-Ms represent the concentrations above which adverse biological effects are likely. The LTMS Guidelines are not a set of regulatory objectives.

In general, the SFRWQCB considers sediment with concentrations less than ambient levels to be acceptable for wetland cover material (the upper 3 feet), and sediment with concentrations less than ER-Ms are acceptable for wetland foundation material (greater than 3 feet below current or designed ground surface elevations). (However, for PCBs the ER-L is used as a guideline for cover material.) For some chemical constituents, the ambient value is greater than the respective ER-L. However, the SFRWQCB acknowledges that it is not practical to regulate to concentrations “cleaner” than ambient conditions.

Table 3.3-5 LTMS Sediment Guidance

CHEMICAL CONSTITUENT	SAN FRANCISCO ESTUARY SEDIMENT AMBIENT CONCENTRATIONS (MG/KG)	EFFECTS RANGE-LOW, ER-L (MG/KG)	EFFECTS RANGE-MEDIAN, ER-M (MG/KG)
Metals			
Arsenic	15.3	8.2	70
Cadmium	0.33	1.2	9.60
Chromium	112	81	370

Table 3.3-5 LTMS Sediment Guidance

CHEMICAL CONSTITUENT	SAN FRANCISCO ESTUARY SEDIMENT AMBIENT CONCENTRATIONS (MG/KG)	EFFECTS RANGE-LOW, ER-L (MG/KG)	EFFECTS RANGE-MEDIAN, ER-M (MG/KG)
Copper	68.1	34	270
Lead	43.2	46.7	218
Mercury	0.43	0.15	0.71
Nickel	112	20.9	51.6
Selenium	0.64	-	-
Silver	0.58	1	3.7
Zinc	158	150	410
Pesticides			
Aldrin	0.0011		
Dieldrin	0.00044	0.000715 [1]	0.0043 [2]
p,p'-DDD	-	0.00122 [1]	0.00781 [2]
p,p'-DDE	-	0.00220	0.027
p,p'-DDT	-	0.00119 [1]	0.00477 [2]
Endrin	0.00078	-	-
Hexachlorobenzene	0.000485	-	-
Sum of chlordanes (SFEI list)	0.0011	0.00226 [1]	0.00479 [2]
Sum of DDTs (SFEI list)	0.007	0.00158	0.0461
Sum of HCH (SFEI list)	0.00078	-	-
Sum of PCBs (SFEI list)	0.0216	0.0227	0.18
PAHs			
1-Methylnaphthalene	0.0121	-	-
1-Methylphenanthrene	0.0317	-	-
2,3,5-Trimethylnaphthalene	0.0098	-	-
2,6-Dimethylnaphthalene	0.0121	-	-
2-Methylnaphthalene	0.0194	0.07	0.67
2-Methylphenanthrene	0.0266	-	-
Acenaphthene	0.0317	0.016	0.5
Acenaphthylene	0.0266	0.044	0.64
Anthracene	0.088	0.0853	1.1
Benz(a)anthracene	0.244	0.261	1.6
Benzo(a)pyrene	0.412	0.43	1.6
Benzo(b)fluoranthene	0.371	-	-
Benzo(e)pyrene	0.294	-	-
Benzo(g,h,i)perylene	0.310	-	-
Benzo(k)fluoranthene	0.258	-	-
Biphenyl	0.0129	-	-
Chrysene	0.289	0.384	2.8
Dibenz(a,h)anthracene	0.0327	0.0634	0.26
Fluoranthene	0.514	0.6	5.1
Fluorene	0.0253	0.019	0.54
Indenol(1,2,3-c,d)pyrene	0.382	-	-
Naphthalene	0.0558	0.16	2.1
Perylene	0.145	-	-

Table 3.3-5 LTMS Sediment Guidance

CHEMICAL CONSTITUENT	SAN FRANCISCO ESTUARY SEDIMENT AMBIENT CONCENTRATIONS (MG/KG)	EFFECTS RANGE-LOW, ER-L (MG/KG)	EFFECTS RANGE-MEDIAN, ER-M (MG/KG)
Phenanthrene	0.237	0.24	1.5
Pyrene	0.665	0.665	2.6
Sum of HPAHs (SFEI list)	3.060	1.7	9.6
Sum of LPAHs (SFEI list)	0.434	0.552	3.16
Sum of PAHs (SFEI list)	3.390	4.022	44.792

Notes:

[1] Threshold Effects Level, as established by the Florida Department of Environmental Protection (FDEP); no ER-L was established.

[2] Probable Effects Level, as established by the FDEP; no ER-M was established.

Waste Discharge Requirements

The SFRWQCB has issued waste discharge requirements to the USFWS and the California Department of Fish and Wildlife (CDFW) for discharges from the SBSPs and for ongoing maintenance activities. Water Quality Order No. R2-2004-0018 was issued in conjunction with actions taken under the ISP and Water Quality Order No. R2-2008-0078, as revised by R2-2012-0014, was issued for Phase 1 actions (SFRWQCB 2006, 2008, 2012). These requirements permit discharge from certain ponds under an initial release scenario where high salinities discharged from certain ponds may impact beneficial uses in the short term, but impacted areas are expected to fully recover within 1 year. The initial release refers to the time expected to substantially empty salt ponds of their current contents. These requirements also permit subsequent discharge from these ponds as waters from the South Bay are taken into pond systems and then discharged more-or-less continuously (continuous circulation). For the continuous circulation period, the pond systems are required to be managed to ensure beneficial uses remain protected.

The main parameters of concern initially identified by the SFRWQCB include salinity, metals, dissolved oxygen, pH, and temperature. Subsequent permits also identify mercury, nutrients, and algae. Discharge limitations specified by the order include numeric criteria for salinity during the initial discharge and during continuous circulation, dissolved oxygen, pH, and temperature. (Salinity is used as an indicator parameter for the concentrations of metals—concentrations of metals were considered to not impact Bay waters if the salinity of the discharge was limited to 44 ppt.) Water Quality Order No. R2-2008-0078 also specifies receiving water limitations effective at the contour line for mean lower-low water level (i.e., 0 foot elevation, North American Vertical Datum of 1988 [NAVD88]) for dissolved oxygen, dissolved sulfate, pH, ammonia, nutrients, and turbidity. The order also acknowledges that ponds and sloughs have variable dissolved oxygen levels and often are below the 5.0 mg/L objective due to algal activity.

As indicated in the SBSP waste discharge requirements, the SFRWQCB expects that the SBSP Restoration Project would create net environmental benefits with respect to water quality and beneficial uses. The SFRWQCB indicates that restoring tidal wetland functions to former salt ponds would improve water quality in the South Bay estuary on a spatially significant scale with large contiguous habitat to maximize transitional habitat (ecotones) and minimize non-native vegetation (if appropriate management efforts are taken to control non-native species). Marsh systems that are tidally connected to the estuary improve water quality by filtering and fixing pollutants in addition to protecting beneficial uses by providing nursery habitat and protection from predation for native fish species, significant biological productivity to the estuarine system, and habitat for rare and endangered species. Successful restoration would also provide shallow-water habitat for migrating shorebirds and foraging and nesting islands for birds. Operating former salt ponds as managed ponds is considered by the SFRWQCB to be a transitional phase between salt-making and restoration. This transitional pond management phase for most of the former salt ponds would benefit the environment in the near term by providing shallow open water habitat for shorebirds, thus avoiding the consequences of operating them as seasonal ponds. In addition to habitat and water quality benefits, tidal marsh restoration would also help protect communities from floods, storms, and sea-level rise.

Emerging Programs of Water Quality Standards

Emerging programs that may result in new water quality or sediment quality criteria include:

- The SFRWQCB is working with the SWRCB, the Southern California Coastal Water Research Program, and SFEI to develop nutrient numeric endpoints for the Bay to address nutrient over-enrichment (eutrophication) in state waters.
- Trash could be listed as an impairing pollutant in many urban creeks, including the Guadalupe River and Coyote Creek during the lifetime of this project. Measures to reduce trash would likely be implemented through the Municipal Regional Permit for stormwater; if these do not succeed, a trash TMDL is a potential next regulatory step. Pathogens could follow a similar trajectory.

New objectives resulting from these programs are considered in the evaluation of impacts.

3.3.3 Environmental Impacts and Mitigation Measures

Overview

The potential to exceed the thresholds of significance for each impact is evaluated and summarized below. Impact evaluations for the Action Alternatives are assessed based on the existing conditions and the anticipated future conditions that would occur under the No Action Alternative. In this case, the No Action Alternative represents no change from current management direction, practices, or level of management intensity provided in the AMP and USFWS's pond operations plan. Under each potential impact, the likelihood of occurrence and the potential for mitigation are discussed. If there is considerable uncertainty about the likelihood of occurrence, the information needed to reduce the uncertainty is described.

Significance Criteria

For the purposes of this Final EIS/R, the project is considered to have adverse impacts on water quality or groundwater resources if it would:

- Violate water quality standards or otherwise substantially degrade water quality; or
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

The SBSP Restoration Project alternatives would not interfere with groundwater recharge or deplete groundwater supplies through groundwater extraction. Potable groundwater supplies could be affected by changes in salinity.

For the purpose of this impact assessment, the thresholds of significance are applied to changes from baseline conditions that result from factors within the control of the project proponents. Ambient water quality in the Bay itself, though discussed in the impact sections, is considered outside the control of the project proponents.

Water Quality

Thresholds of significance are used to define indicators of significant environmental impacts. In general, thresholds should be objective and based on existing standards (see Tables 3.3-1 to 3.3-5). Some potential impacts have also been identified as "staircase issues" for the AMP. The "restoration staircase" was a concept developed for the SBSP Restoration Project at its program-level and was included in the 2007 EIS/R. Staircase issues are areas of uncertainty for which it is difficult to predict specific outcomes based on the available data and current understandings of the system. The staircase issues are being addressed through the AMP, which includes monitoring to measure and track actual outcomes of management and restoration actions, together with predefined triggers designed to detect adverse outcomes early on, before they reach levels of significance. Corrective actions can thus be developed and implemented before the thresholds of significance are reached. If monitoring indicates that no adverse impacts are occurring, then the planned restoration can continue along the staircase to the next step. For water quality impacts, the staircase issues are (1) changes in algal composition leading to nuisance algal blooms; (2) algal blooms leading to low dissolved oxygen levels; (3) increased mercury methylation and bioaccumulation, and (4) mobilization and transport of mercury-contaminated sediments and other pollutants. Triggers for adaptive management actions are typically established well below the thresholds of significance to ensure that the thresholds of significance are not exceeded.

Threshold for Changes in Algal Composition and Abundance

Project activities that lead to unacceptable increases in algal abundance would be deemed to have significant impacts if the SFRWQCB narrative water quality objective for biostimulatory substances is violated:

> Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses. Changes in chlorophyll-a and associated phytoplankton communities follow complex dynamics that are sometimes associated with a discharge of biostimulatory substances. Irregular and extreme levels of chlorophyll a or phytoplankton blooms may indicate exceedance of this objective and require investigation.

Concerns over nuisance algal blooms apply to both free-floating phytoplankton and attached macrophytes. In the Bay, where nutrients are not limiting for algal growth, the biostimulatory substance could be sunlight, in which case the project activity that could potentially promote aquatic growth is localized reduction in suspended load outside a breached levee due to a net loss of suspended load inside the accreting marsh area.

The key indicator that a threshold of significant impact has been exceeded is if algal growths cause nuisance or adversely affect beneficial uses. A key difference between the regional setting (the Bay) and the Phase 2 project setting (managed ponds and restored tidal wetlands) is the baseline with respect to nuisance and protection of beneficial uses. In the regional setting, baseline levels of chlorophyll-a and the expected seasonal variations are well known because of regional monitoring programs. Likewise, dissolved oxygen levels in the regional setting typically meet the Basin Plan water quality objective of

5 mg/L. In contrast, the Bay fringe areas (i.e., former salt ponds, tidal marshes, and sloughs) that make up much of the project setting are known to have higher algal productivity and lower dissolved oxygen levels than in the open Bay. High algal productivity and lower dissolved oxygen levels are common to ponds, wetlands, and sloughs, and do not necessarily indicate degraded or impaired habitat.

Project activities that lead to unacceptable increases in algal composition would be deemed to have significant impacts if the SFRWQCB narrative water quality objective for population and community ecology is violated:

> All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ substantially from those for the same waters in areas unaffected by controllable water quality factors.

The narrative objective is helpful because it recognizes the interactive effect of toxicants on changes in community structure. For example, some species of algae (e.g., diatoms) are more resistant to free ionic copper than others (e.g., blue-green algae), and this difference can exert a significant effect on algal community structure. Establishing the narrative objective as a threshold ensures that adaptive management actions would address the interactive effects of biostimulation and other controllable water quality factors that can alter algal composition. The complexity of defining thresholds and baselines for algal abundance and composition is one reason this issue is being handled as a staircase issue. The narrative objectives cited above are sufficient as thresholds for the purposes of this analysis.

Threshold for Localized, Seasonal Low Dissolved Oxygen Levels

The threshold for low dissolved oxygen levels is established by the Basin Plan water quality objective for dissolved oxygen (see Table 3.3-1). Low dissolved oxygen levels can cause mortality in aquatic and benthic organisms (Impact 3.3-2, below), increased mercury methylation rates (Impact 3.3-3, below), and increased rates of disease such as avian botulism. In the Bay, low dissolved oxygen levels correspond to 5 mg/L dissolved oxygen or less for tidal waters, although the objective acknowledges that attaining 80 percent oxygen saturation as a 3-month median is satisfactory for protection of beneficial uses. In the Phase 2 project setting (managed ponds and restored tidal wetlands), the threshold for significance would vary depending on the habitat type. For open, fully tidal waters, the threshold is the same as for the regional setting—dissolved oxygen levels greater than 5 mg/L or at least 80 percent saturation as a 3-month median. But waters that are subject to muted or constrained tidal action (e.g., the managed ponds) function differently because they are managed primarily for wildlife habitat (avian species use). Restricted circulation often results in low dissolved oxygen levels. Therefore, for this analysis, low dissolved oxygen levels alone are not considered a threshold for managed ponds. Rather, the threshold for significant impacts is low dissolved oxygen levels and at least one of the following negative impacts of low dissolved oxygen: mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates (see discussion of methylmercury, below).

This impact is also considered a staircase issue. To avoid exceeding thresholds of significant impact, the AMP defines triggers and associated adaptive management actions to prevent an impact from occurring.

Increased Methylmercury Production, Bioaccumulation, and Mobilization and Transport of Mercury-Contaminated Sediments

The project would have significant impacts to both the regional setting and the project setting if project actions resulted in water quality conditions that exceed the tissue-based mercury water quality objectives in the Basin Plan, as summarized in Table 3.3-4. The Bay Mercury TMDL also discusses a bird egg monitoring target that is also considered during evaluation of impacts. The bird egg monitoring target is a concentration of less than 0.5 mg/kg mercury for bird eggs (wet weight). This concentration is the lowest observable effect level for reproductive impairment in the endangered least tern. For Pond A8 studies a toxicity threshold of 0.9 mg/kg mercury fww (fresh wet-weight) for bird eggs has also been established for Forster's terms, which are present in the project area (Ackerman and Eagles-Smith 2008). In addition, the narrative water quality objective for bioaccumulation is considered to be a threshold for significant impacts:

> Many pollutants can accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.

Establishing this narrative objective as a threshold of significant impact clarifies that the main concern over mercury is methylmercury, because methylmercury is the primary mercury form that bioaccumulates.

In the regional setting, the threshold for significant impacts for total mercury concentrations in sediments is based, in part, on the suspended sediment mercury target established in the Bay mercury TMDL. The TMDL includes a target for mercury in suspended sediments of 0.2 mg/kg, computed as an annual median. It is important to recognize that the Bay is currently over this target, which is in part why a TMDL for mercury is being implemented. Project activities that release sediments to the Bay with a median mercury concentration exceeding ambient conditions (and this target value) would be deemed to have significant impacts. The threshold for impacts to managed ponds and restored tidal wetlands for total mercury in sediments is based on the ER-M for mercury (0.7 mg/kg), from the LTMS Guidelines for the beneficial re-use of dredged and sediments (see Table 3.3-5). Project activities that would result in sediments within the SBSP Restoration Project area that exceed this guideline would be deemed to have significant impacts. Low oxygen conditions are known to increase the risk of methylmercury production. Therefore, more sensitive thresholds for mercury concentrations in sediment could be considered for areas prone to low dissolved oxygen levels to stay below the threshold defined by the narrative objective for bioaccumulation.

Methylmercury bioaccumulation is identified as a staircase issue. The AMP is framed to avoid exceedance of thresholds by developing triggers for adaptive management actions. Triggers are based on methylmercury concentrations in water and sediments, net methylmercury production rates, and mercury concentrations in sentinel species in comparison to levels prior to restoration. Site-specific food web modeling and other tools have also been developed as part of the AMP. Because of the complexity of the biogeochemical processes affecting the conversion of mercury to methylmercury and its accumulation in the food chain, the impacts of mercury mobilization and transport and increased methylmercury production and bioaccumulation are addressed by the AMP.

Mobilization and Transport of Other Contaminants

For all other contaminants, the thresholds for significant impacts are the water quality objectives for the Bay established in the Basin Plan. Project activities that would cause an exceedance of these water quality objectives are deemed to have significant impacts. For pollutants of concern in sediments, the LTMS Sediment Guidance (Table 3.3-5) is also considered. A project activity would be considered to have significant impacts if it causes a detrimental increase in constituent concentrations above ambient conditions or above the ER-M. Some metals, such as nickel, have concentrations that are naturally higher than the ER-M.

Groundwater Quality

The threshold for an impact to groundwater quality is a substantial increase in the potential for salinity intrusion from the Bay into deep potable aquifers. This increase would be indicated by a project-related increase in salinity or total dissolved solids (TDS) at monitoring wells protecting water supplies that exceeds the narrative objective for salinity or the numeric objective for TDS or violates the state's anti-degradation policy by unreasonably degrading the quality of high-quality water. The water quality objective for TDS in municipal water supplies is 500 mg/L.

Program-Level Evaluation Summary

The determination was made in the 2007 EIS/R that Programmatic Alternative A (the No Action Alternative) would result in a potentially significant impact and that both Action Alternatives would result in a less-than-significant impact for the following metrics:

- Changes in algal abundance and composition, which could in turn degrade water quality by lowering dissolved oxygen and/or promoting the growth of nuisance species;
- Potential to cause localized, seasonally low dissolved oxygen levels as a result of algal blooms, increased microbial activity, or increased residence time of water;
- Potential to mobilize, transport, and deposit mercury-contaminated sediments, leading to exceedance of numeric water quality objectives, TMDL allocations, and sediment quality guidelines for total mercury; and
- Potential increase in net methylmercury production and bioaccumulation in the food web.

The potential to cause seawater intrusion of regional groundwater sources was also considered potentially significant under No Action conditions, but less than significant in the Action Alternatives, one of which was selected for program-level implementation.

Under Programmatic Alternative A, it was determined that the lack of monitoring triggers and commitments to take adaptive management actions could lead to potentially significant changes in water quality. Under Programmatic Alternatives B and C, the conceptual designs of the overall alternatives in addition to the implementation of the AMP would reduce uncertainties, adverse water quality conditions, and adverse conditions associated with unintentional levee breaches. At the program level, the decision was made to select Programmatic Alternative C and implement Phase 1 actions.

Project-Level Evaluation

Phase 2 Impact 3.3-1: Degradation of water quality due to changes in algal abundance or composition.

Eutrophication, the process in which water bodies receive excess nutrients that stimulate excessive plant growth, is a potential concern in both the regional setting (the Bay) and the Phase 2 project settings (managed ponds and restored tidal wetlands). The conceptual model for coastal eutrophication emphasizes both direct and indirect factors that lead to changes in algal abundance and composition. These factors include water transparency, distribution and abundance of larger plants, nutrient ratios and their effect on algal assemblages, chemical transformations in sediment, the life cycle of bottom-dwelling and free-swimming invertebrates, and responses to toxic pollutants and other stressors (Cloern 2001). The reason for concern over increases in and changes to algal communities is the potential to impair the beneficial uses of water in the SBSP Restoration Project area and in the Bay. Changes to algal abundance and composition could cause nuisances and harm in aquatic ecosystems, including the red tides caused by dinoflagellates; paralytic shellfish poisoning caused by diatoms; and mats of blue-green algae that are unsightly, cause odors, and lead to depressed dissolved oxygen levels when they decay. Excess nutrients are an emerging water quality issue in San Francisco Bay, but it difficult is to predict specific ecosystem responses to increased nutrient loading. In general, however, tidal marshes and transition zones can uptake nutrients at a high rate and help ameliorate that potential issue.

The potential for changes in algal abundance and composition depends on a number of factors, including:

- Availability of limiting nutrients. The additional input of nutrients that otherwise limit algae production can stimulate algal growth, although there are other attenuating factors.
- Water transparency. Increased water transparency can stimulate plankton growth where light is the limiting factor, rather than nutrients. Bay waters are generally light limited, however, the limiting factor within restored tidal wetlands and managed ponds is not known.
- Hydraulic residence time. Within a managed pond or tidal marsh, the growth of free-floating algae is balanced by removal due to seasonal releases, for ponds, or tidal flushing, for marshes.
- Composition of zooplankton grazers. The amount of grazing organisms present and their food preference exerts a direct effect on algal community structure.
- Concentrations of biologically available metals that are toxic to algae. Different species of algae have different tolerances for metal toxins, such as copper. Metal toxicity is regulated by the amount of metal available for uptake by algae.

Each of these direct factors is dependent on a number of indirect factors. For example, nutrient concentrations are affected by both external sources and internal cycling at the sediment-water interface. Hydraulic residence time can change as water depths drop because of increased pond bottom elevations due to accretion. Water transparency decreases as suspended sediment increases, so wind shelter that creates quiescent areas can lead to increased light penetration inside restored tidal wetlands and managed ponds. Accretional areas that trap sediments within the ponds can decrease turbidity in areas adjacent to breached levees. Light penetration can be decreased by algal blooms, especially macrophytic algae. The composition of zooplankton grazer populations responds to changes both in the available food and the intensity of predation from higher organisms. The amount of biologically available metals, such as copper, present in the water column can shift in response to not only changes in metal concentrations but also the amounts of complexing agents present (e.g., dissolved organic matter) that reduce metal availability for uptake by algae. The intricacy of interactive effects between direct and indirect factors makes prediction of the exact response to project alternatives difficult, which is why effects are managed adaptively.

The AMP would address the uncertainties regarding the relationship between project activities and thresholds for significant impacts to algal abundance and composition by monitoring chlorophyll, growth rates, species composition, benthic habitat quality, benthic invertebrate communities, and sediment dissolved oxygen and oxidation-reduction (redox) profiles, as appropriate and necessary. Should project activities cause adverse changes to water quality, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of managed ponds and restored tidal marshes).

The baseline conditions are different for the analysis in this Final EIR/S than in the 2007 EIR/S. In the 2007 EIR/S, the Programmatic No Action Alternative assumed not doing the program-level project also meant that the AMP would not be implemented. A program-level Action Alternative (Alternative C) was selected and is being implemented; that alternative included the AMP. Therefore, for the purposes of this analysis, the assumption now is that the landowners will continue to implement the AMP measures that maintain water quality. For this reason, some of the Phase 2 project-level significance determinations for the No Action Alternatives are different in this Final EIR/S analysis than in the 2007 EIR/S.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), existing breaches would continue to allow tidal inundation at the Island Ponds. Continued restoration of tidal marsh habitat would import sediment from tidal waters and continue to raise pond bottom elevations. Tidal flows would bring slough water through the breaches, where suspended sediments would settle out from the water before ebb flows. Accretion in the tidal marsh would decrease suspended sediment supply in the surrounding sloughs and open waters of the Bay, potentially resulting in increased light penetration and algal abundance outside of the ponds.

High-risk factors within any particular pond complex are waters that are deep, slow, rich in nutrients and chlorophyll, subject to calm wind exposure, and highly transparent. Conversely, the lowest-risk waterbodies would likely be shallow, quickly turned over, poor in nutrients and chlorophyll, windy and opaque. Fully tidal systems (both tidal ponds and adjacent sloughs) have short retentions times, are well mixed by tidal flows, and are often subject to wind and wave action. Therefore, the risk factors are relatively low and potential changes in algal abundance are likely to be minimal.

Adaptive management would also be used to address adverse changes in the abundance and composition of algal species. If triggers are exceeded as a result of high-risk factors, then adaptive management actions would be implemented that convert high-risk factors to low-risk factors. Examples of such actions may include making water shallower with fill, decreasing hydraulic residence times, or increasing exposure to wind. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, the Island Pond levees would be lowered or removed and Pond A19's northern levee would be breached to Mud Slough. This action would increase tidal flows in Mud Slough, which would scour the slough, causing it to deepen and widen. Areas near the new levee breaches would have increased accretion (e.g., in the northern portion of Pond A19). Sediment accreted in the tidal marsh would decrease suspended sediment supply in sloughs, potentially resulting in increased light penetration and algal abundance. Fully tidal systems (both tidal ponds and sloughs) have relatively short retentions times, are well mixed by tidal flows, and are often subject to wind and wave action. Therefore, the risk factors are low and potential changes in algal abundance are likely to be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, levees would be lowered or removed, all three ponds would be breached to Mud Slough, existing levee breaches would be widened, and existing channels inside Pond A19 would be extended to enhance delivery of sediment to the interior of the pond. Potential impacts from Alternative Island C would be similar to the impacts from Alternative Island B. The risk factors are low, and potential changes in algal abundance are likely to be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new activities would be implemented as part of Phase 2. The pond cluster would continue to be managed through the activities described in the AMP, in accordance with current USFWS practices. The Mountain View Ponds are currently operated for limited directional circulation through Ponds A1 and A2W, while maintaining discharge salinities to the Bay at less than 40 ppt. The current use of water in Charleston Slough to supply water to Shoreline Park’s sailing lake would also continue.

Accretion rates within the ponds would be minor due to the limited directional circulation, and therefore changes in turbidity levels in adjacent sloughs due to pond operations would also be minor. Although the ponds are relatively deep and subsided, the summer hydraulic residence time within the Ponds A1 and A2W system is estimated to be 12 days (SFRWQCB 2008), which is shorter than larger pond systems in unaltered portions of the Alviso pond complex but much longer than fully tidal systems. Therefore, the risk factors are moderate, and potential changes in algal abundance would not be expected to be substantial. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would increase tidal flows in Ponds A1 and A2W by breaching levees at several locations in Pond A2W and at one location in Pond A1. The breaches in Pond A2W to Whisman Slough would be armored and bridged for Pacific Gas and Electric Company (PG&E) access along the levee and out to the Bay-side levee of this pond. Levee breaches would allow full tidal inundation to the ponds, increasing tidal flows and scour in adjacent sloughs and increasing accretion rates within the ponds. Fully tidal systems (both tidal ponds and adjacent sloughs) have short retentions times, are well mixed by tidal flows, and are often subject to wind and wave action. Therefore, the risk factors are relatively low and changes in algal abundance would likely be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Pond A1 would be breached at three locations, Pond A2W would be breached at four locations, and the existing levee across Charleston Slough would also be breached or have its tide gates removed. The primary water intake for Shoreline Park's sailing lake would be relocated into the breach between Charleston Slough and Pond A1. Similar to the effects described for Alternative Mountain View B, these Phase 2 actions would allow full tidal inundation to the ponds, increasing tidal flows and scour in adjacent sloughs and increasing accretion rates within the ponds. Full tidal inundation would also occur at Charleston Slough, increasing mixing and decreasing residence time. Fully tidal systems (both tidal ponds and adjacent sloughs) have short retentions times, are well mixed by tidal flows, and are often subject to wind and wave action. Therefore, the risk factors are relatively low and changes in algal abundance would likely be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), USFWS would continue to operate and maintain the A8 Ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. The A8 Ponds would continue to have muted tidal exchange with Ponds A5 and A7 and also with Guadalupe Slough through the Pond A8 notch. Water exchange would be limited and managed, and the tidal range within the ponds would be muted during the dry summer and fall months. Even with the fully open notch, water level fluctuations in the ponds are small relative to fully tidal habitats; over a tidal cycle, water levels in Ponds A5, A7, and A8 would vary by approximately 0.5 foot compared to the greater than 8-foot tide range in Alviso Slough (SFRWQCB 2008). Nonetheless, this muted tidal exchange would facilitate mixing and reduce residence times, similar to exchange through other water control structures. Therefore, the risk factors are moderate and potential changes in algal abundance would not be expected to be substantial. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be constructed in Pond A8S's southwest and southeast corners. The Phase 2 actions would not change water levels in the A8 Ponds or interfere with water circulation. Potential effects to changes in the abundance and composition of algal species would be similar to those discussed under Alternative A8 A. Impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new activities would be implemented as part of Phase 2. Ponds R3, R4 and R5/S5 would continue to function as seasonal ponds. Seasonal ponds are passively managed; they receive direct precipitation, groundwater inflows, and minimal overland runoff during the wet season. During the dry season, seasonal ponds are allowed to dry out by seepage and evaporation. Although conditions within the ponds would be shallow and warm with high salinity and low dissolved oxygen levels, there would be very limited exchange (if any) with adjacent sloughs or the Bay. Therefore, effects to the abundance and composition of algal species in areas outside of the pond would be minimal and impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to Ravenswood Slough to allow full tidal inundation, Pond R3 would remain a seasonal pond, but a water control structure would be added to connect it to Ravenswood Slough to allow occasional, managed inflow to the borrow ditches and historic slough traces, which would improve forage habitat for western snowy plover. Ponds R5 and S5 would be converted from seasonal ponds to managed ponds through the construction of water control structures and some earthmoving. Pond R4 and portions of Ravenswood Slough would experience increased tidal flows. Fully tidal systems (both tidal ponds and sloughs) have short retentions times, are well mixed by tidal flows, and are often subject to wind and wave action. Therefore, the risk factors are relatively low and potential changes in algal abundance would be minimal. Pond R3 would continue to have very limited exchange (if any) with Ravenswood Slough and would not cause substantial changes to algae in the slough.

Ponds R5 and S5 would be converted to managed ponds, which would have managed exchange with Flood Slough and Pond R4. If not well managed, these ponds could become stagnant and rich in nutrients, and therefore would have higher risk factors for changes to algal abundance. However, water control structures connecting Ponds R5 and S5 with Pond R4 and Flood Slough, respectively, would allow directional circulation and other management activities to minimize adverse effects. Should managed ponds cause adverse changes to algal abundance and composition, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of the managed ponds). Because adaptive management would be used to minimize adverse effects from managed ponds, impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would have similar effects to those described for Alternative Ravenswood B, with the following exceptions: Pond R4 would also be breached to the channel between it and Greco Island, Ponds R5 and S5 would be converted and managed to simulate an intertidal mudflat, and water control structures would be installed on Pond R3 to allow occasional managed inflow to the borrow ditches and historic slough traces, which would improve forage habitat for western snowy plover.

Pond R4 and portions of Ravenswood Slough and the channel near Greco Island would experience increased tidal flows and have short retentions times. Therefore, the risk factors are relatively low and potential changes in algal abundance would be minimal.

Ponds R3, R5, and S5 would have limited exchange with Ravenswood Slough, Flood Slough, or Pond R4 through water control structures. The water control structure connecting Pond R3 to Ravenswood Slough would be opened during the incoming tide to reduce potential discharges. The water control structures between Flood Slough and Pond S5 and between Pond R5 and Pond R4 would be operated to provide directional circulation. If not well managed, water in Ponds R5 and S5 could become stagnant and rich in nutrients, and therefore these ponds have higher risk factors for changes to algal abundance. However, the water control structures and the simulation of daily tidal cycles would reduce this risk. (Risks for adverse changes in algal abundance in managed mudflats would be lower than for other types of managed ponds, but greater than for fully tidal systems.) Should these ponds cause adverse changes to algal abundance and composition, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of the managed ponds). Because adaptive management would be used to minimize adverse effects from managed ponds, impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, install water control structures on Pond R3, remove levees within and between Ponds R5 and S5, convert Ponds R5 and S5 to enhanced managed ponds, and allow stormwater outflow from the Bayfront Canal and Atherton Channel to flow into Ponds R5 and S5.

Similar to the effects described above for Alternative Ravenswood B, tidal flows in Pond R4 and portions of Ravenswood Slough would allow tidal mixing with short retention times. Therefore, the risk factors are relatively low and potential changes in algal abundance would likely be minimal.

Ponds R3, R5, and S5 would have limited exchange with Ravenswood Slough, Flood Slough, and Pond R4 through water control structures. The water control structure connecting Pond R3 to Ravenswood Slough would be opened only during the incoming tide to reduce potential discharges. The water control structures between Flood Slough and Pond S5 and between Pond R4 and Pond R5 could be operated to provide directional circulation. If not well managed, water in the managed ponds could become stagnant and rich in nutrients, and therefore there would have higher risk factors for changes to algal abundance. However, the water control structures and regular cycling of water through the ponds would minimize adverse effects. Stormwater inflow would increase circulation, but could also contribute additional nutrients. Should these ponds cause adverse changes to algal abundance and composition, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of the managed ponds). Because adaptive management would be used to minimize adverse effects from managed ponds, impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.3-2: Degradation of water quality due to low dissolved oxygen levels.

Dissolved oxygen in the water column is necessary to support respiring organisms. Dissolved oxygen is depleted in pond and marsh environments by respiration and chemical and microbial aerobic processes.

Dissolved oxygen is replenished in the system through photosynthesis and reaeration (i.e., oxygen transfer from the atmosphere). Changes in water flow, residence time, and algal abundance productivity (see Impact 3.3-1, above) could change dissolved oxygen levels in managed ponds, tidal marsh habitat, and discharges from project areas into the Bay. Potential impacts of low dissolved oxygen levels include depressed species diversity, fish kills, death of other aquatic organisms, and odor problems. Even short periods of depressed dissolved oxygen levels can lead to death of aquatic organisms. Another impact of low dissolved oxygen levels, discussed under Impact 3.3-3, below, is increased net methylmercury production.

Microbial degradation of organic matter in pond and marsh sediments can have significant oxygen demand. Death of algae and aquatic organisms contributes to the organic matter supply and oxygen demand is dependent on the amount of organic matter available to decay. Respiration may also be a significant oxygen demand if algae and organism populations are large. Algae are net oxygen consumers at night, when wind-driven reaeration is low. This creates periods of low dissolved oxygen levels. Dissolved oxygen is then replenished during the day when the algae photosynthesize instead of respiring and wind-driven reaeration increases. Reaeration rates are largely dependent on wind mixing and flow rates. Mixing brings low-dissolved-oxygen waters to the surface, driving oxygen transfer, and turbulence increases the surface area for oxygen transfer. Waters flowing slowly through a pond would not be as well mixed as faster-moving waters. Stagnant conditions can lead to anoxic waters if oxygen demands exceed reaeration.

Environments of varying dissolved oxygen ranges can support different communities. Tidal marshes and ponds designed for shorebird habitat may flourish under lower dissolved oxygen conditions than deeper-water communities. For this reason, the water quality standard for dissolved oxygen is thoughtfully applied to areas where the dissolved oxygen level is expected to be naturally low, such as slow-moving or standing water over vegetated areas or mudflats. Fringe areas of the Bay, particularly managed ponds, are expected to experience periodic declines in dissolved oxygen levels.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), existing breaches would continue to allow full tidal inundation at the Island Ponds. Tidal flows would bring Bay water through the breaches, where suspended sediments would settle out from the water before ebb flows. Fully tidal systems have relatively high reaeration rates because filling and draining of the ponds causes increased mixing and higher flow rates to the ponds and downstream sloughs, and because ponds are subject to wind mixing. Therefore, the risk of poor dissolved oxygen levels in breached ponds would be low and impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, pond levees would be lowered or removed, and Pond A19's northern levee would be breached to Mud Slough. The Island Ponds would continue to have full tidal inundation and tidal flows in Mud Slough and circulation between Ponds A19 and A20 would increase. Fully tidal systems have relatively high reaeration rates because filling and draining of the ponds causes increased mixing and higher flow rates to the ponds and downstream sloughs, and because ponds are subject to wind mixing. Therefore, the risk of poor dissolved oxygen levels in breached ponds would be low and impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, levees would be lowered or removed, all three ponds would be breached to Mud Slough, existing levee breaches would be widened, and existing channels inside Pond A19 would be extended to enhance delivery of sediment to the interior of the pond. The Island Ponds would continue to have full tidal inundation. Potential impacts from Alternative Island C would be similar to the impacts described in Alternative Island B. Therefore, the risk of poor dissolved oxygen levels in breached ponds would be low and impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), Ponds A1 and A2W would continue to be operated with limited directional circulation. The current use of water in Charleston Slough to supply water to Shoreline Park's sailing lake would also continue.

Maintaining adequate dissolved oxygen levels in managed ponds of the Alviso pond complex has been the major water quality challenge. The SFRWQCB has recognized that it may not be feasible for a well-operated lagoon system to meet an instantaneous dissolved oxygen discharge limitation of 5.0 mg/L. Also, it has been noted that sloughs in the South Bay often do not meet the Basin Plan objective of 5.0 mg/L. For this reason, the project has been implementing adaptive management practices if dissolved oxygen levels fall below a 10th percentile of 3.3 mg/L (calculated on a weekly basis) at the point of discharge.[7] These values represent natural dissolved oxygen variations in sloughs or lagoon systems. Even using this trigger value as a threshold, corrective measures have been implemented repeatedly in the Alviso pond complex to address low dissolved oxygen levels in managed pond discharges, such as discharge timing, implementing muted tidal flows, and installing baffles (SFRWQCB 2008).

Adaptive management measures have been implemented in the Mountain View Ponds to address issues with low dissolved oxygen. The ponds are now operated under directional flow to maximize flow-through and reduce stagnant areas in the back portions of the ponds. Circulation can be further increased in the pond system by opening the inlet further, or if increased flows are not possible, fully opening the discharge gate to allow the pond to become a muted tidal system until pond dissolved oxygen levels revert to levels at or above conditions in the Bay or slough (USFWS and USGS 2012).

Under the No Action condition, similar adaptive management measures would be implemented during low dissolved oxygen conditions (e.g., changing residence times and/or water depths). Due to the limited tidal flushing with the current system, low dissolved oxygen levels still occur from time to time, a situation similar to the existing condition. Because this condition already exists, and the No Action Alternative at the Mountain View Ponds would not worsen that, there would be a less-than-significant impact.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would increase tidal flows in Ponds A1 and A2W by breaching levees at several locations in Pond A2W and at one location in Pond A1. Levee

[7] This dissolved oxygen trigger was based on levels found in Artesian Slough near Heron Rookery in July 1997 (SFRWQCB 2008).

breaches would allow full tidal inundation to these ponds and increased tidal flows and scour in adjacent sloughs. After breaching Ponds A1 and A2W, the amount biological oxygen demand in ebb flows may temporarily increase; however, tidal currents would provide flushing flows and mixing to improve reaeration and dilute nutrients. Fully tidal systems have relatively high reaeration rates from the filling and draining of the ponds with the tide cycle and because the ponds are subject to wind mixing. Therefore, the risk of poor dissolved oxygen levels in breached ponds would be low and impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Pond A1 would be breached at three locations, Pond A2W would be breached at four locations, and the existing levee across Charleston Slough would be breached or have its tide gates removed. These Phase 2 actions would allow full tidal inundation to Ponds A1 and A2W, increasing tidal flows and scour in adjacent sloughs. Charleston Slough would also become fully tidal.

Similar to the effects described for Alternative Mountain View B, the amount biological oxygen demand in ebb flows may temporarily increase after breaching the Mountain View Ponds; however, tidal currents would provide flushing flows and mixing to improve reaeration and dilute nutrients. Fully tidal systems have relatively high reaeration rates from the filling and draining of the ponds with the tide cycle, and because the ponds are subject to wind mixing. Shallow water environments, such as Charleston Slough, would allow dissolved oxygen from surface reaeration to rapidly become vertically well mixed. Therefore, the risk of poor dissolved oxygen levels in breached ponds would be low and impacts would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative: A8 A (No Action). Under Alternative A8 A (the No Action Alternative), the A8 ponds would continue to have muted tidal exchange with Ponds A5 and A7 and also with Guadalupe Slough through the Pond A8 notch. Water exchange would be limited and managed, and the tidal range within the ponds would be muted during the dry summer and fall months.

During the 2011 monitoring season at Pond A8’s discharge notch, daily average dissolved oxygen concentrations ranged from a low of 2.4 mg/L to a high of 14 mg/L. Daily average dissolved oxygen concentrations at Pond A8 rarely fell below the 3.3 mg/L adaptive management trigger; only once in late September and twice during late October did daily dissolved oxygen averages drop below that threshold (USFWS and USGS 2012).

Under the No Action conditions, adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, Phase 2 actions would not change water levels in the A8 Ponds or interfere with water circulation. Potential impacts from low dissolved oxygen levels would be similar to those discussed under Alternative A8 A. Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new activities would be implemented as part of Phase 2 and Ponds R3, R4 and R5/S5 would continue to function as seasonal ponds. Dissolved oxygen concentrations within the ponds would likely be very low, but water would not be discharged from the ponds and any seepage from the ponds would be minimal. Therefore, there would be little to no effect to water quality in adjacent sloughs or open Bay waters and impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to Ravenswood Slough to allow full tidal inundation, and Pond R3 would remain a seasonal pond, but a water control structure would be installed on Pond R3 to allow inflow to improve forage habitat for western snowy plover. Ponds R5 and S5 would be converted from seasonal ponds to managed ponds through the construction of water control structures and some earthmoving.

Initial breaching of Pond R4 may temporarily increase the amount of biological oxygen demand in ebb flows, but tidal currents would also provide mixing, improve reaeration, and dilute nutrients, and the shallow water environment would allow dissolved oxygen from surface reaeration to rapidly become vertically well mixed. Pond R3 would continue to have very limited exchange (if any) with Ravenswood Slough. Ponds R5 and S5 would be converted to managed ponds that have limited exchange with Flood Slough and Pond R4. Depending on how the water control structures between Flood Slough and Pond S5 and between Pond R5 and Pond R4 are operated (i.e., opened for continuous directional flow or primarily closed to provide maximum water depth), the residence time in the ponds could be on the order of hours to days. If residence times are long, water in the managed ponds would likely be stagnant and rich in nutrients, particularly in summer months, and therefore dissolved oxygen concentrations may be low.

Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would have similar effects to those described for Alternative Ravenswood B, with the following exceptions: Pond R4 would also be breached to the channel between it and Greco Island, Ponds R5 and S5 would be converted to managed mudflats, and water control structures would be installed on Pond R3 to allow inflow to improve forage habitat for western snowy plover. The water control structures connecting Pond R3 to Ravenswood Slough would be opened only during the incoming tide to reduce potential discharges.

Ponds R5 and S5 would be managed ponds operated as mudflats that fill and drain with the tide cycle. These flows would provide mixing, improve reaeration, and dilute nutrients and the shallow water environment would also allow dissolved oxygen from surface reaeration to rapidly become vertically well mixed. The risk of poor dissolved oxygen levels in managed mudflats would be lower than in other types of managed ponds, but greater than in fully tidal systems. Therefore, the potential for poor dissolved oxygen levels in Ponds R5 and S5 would be moderately low because of very low residence time.

Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, remove levees within and between Ponds R5 and S5, convert Ponds R5 and S5 to enhanced managed ponds, allow stormwater outflow from the Bayfront Canal and Atherton Channel (which carries stormwater from portions of Redwood City, Menlo Park, Atherton, and unincorporated San Mateo County) to flow into Ponds R5 and S5, and install water control structures on Pond R3. The structure connecting Pond R3 to Ravenswood Slough would be opened only during the incoming tide to reduce potential discharges.

Alternative Ravenswood D would have similar effects to those described for Alternative Ravenswood B, with the exception that stormwater inflow would increase circulation during and shortly after heavy rains, but may also contribute additional nutrients. The contribution from stormwater inflow would occur only during winter storms. Depending on how the water control structures are operated (i.e., opened for continuous directional flow or primarily closed to provide maximum water depth), the residence time in the ponds could be on the order of hours to days. If residence times are long, water in the managed ponds would likely be stagnant and rich in nutrients, particularly in summer months, and therefore dissolved oxygen concentrations may be low.

Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and implementation of adaptive management measures, impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.3-3: Degradation of water quality due to increased methylmercury production or mobilization of mercury-contaminated sediments.

A major concern with mercury pollution in the Bay is the accumulation of methylmercury in biota, particularly at the top of aquatic food webs. Mercury occurs in many forms, but methylmercury is the form that poses the highest bioaccumulation risk. Methylmercury is converted from inorganic mercury primarily by the metabolic activity of bacteria, especially sulfate-reducing bacteria. Because microbial activity is generally increased in productive wetlands and marshes, restoration of tidal marshes has the potential to increase net production of methylmercury.

The linkage between inorganic mercury and methylmercury is complex. Clearly, when no inorganic mercury is present, no methylmercury can be formed. Increased inorganic mercury concentrations in sediments are known to drive increased methylmercury production when considering order-of-magnitude increases. For example, comparing ambient Bay sediments to mercury-contaminated sediments in the Guadalupe River watershed, the latter typically have higher methylmercury concentrations. However, for the range of inorganic mercury concentrations in sediments found within the SBSP Restoration Project area (from 0.1 to 4 ppm), the concentration of inorganic mercury did not have a significant correlation with the concentration of methylmercury.

This analysis of methylmercury impacts focuses on methylmercury in the food chain. The analysis recognizes the latest science supporting water quality standards and moves the evaluation closer to the actual beneficial uses of interest: making fish safe for people and wildlife to eat. Net methylation rates are emphasized because the overall release of methylmercury reflects the balance of production and degradation of methylmercury. Methylmercury can be degraded by sunlight and microbial activity. Dissolved oxygen and sulfide concentrations are examples of water quality factors that affect production of methylmercury. In contrast, microbial community composition (which is dependent on redox conditions) affects net methylmercury production by influencing both production and degradation.

Dissolved oxygen is a factor that can affect net methylmercury production. Sulfate-reducing bacteria that produce methylmercury are known to thrive under low-oxygen conditions. Low-oxygen conditions also promote the breakup of oxide surfaces on particles, which can release methylmercury into the water column. The introduction to Section 3.3.3, above, describes dissolved oxygen as a staircase water quality issue. One of the important points of that discussion is that low dissolved oxygen conditions do occur in wetland and marsh habitats. If low dissolved oxygen is found to drive elevated net methylmercury production and bioaccumulation, this would be considered a significant impact.

There are other factors that affect net methylmercury production, including redox conditions, the chemical form of the inorganic mercury, and sulfate concentrations. Some forms of inorganic mercury are more readily available to methylating bacteria than other forms, particularly neutrally charged soluble sulfide complexes. The amount of available sulfide can, in turn, be affected by iron redox chemistry, which is strongly affected by the nature of vegetative root matter and sediment characteristics. These characteristics set up complex spatial variation in the chemical form of inorganic mercury, with unique pockets of localized methylmercury production rates. There also appears to be an optimum window of sulfate concentrations that maximizes net methylmercury production. Too little sulfate prevents sulfate-reducing bacteria from thriving and producing sulfide, and too much produces so much sulfide that the availability of inorganic mercury is diminished (Benoit et al. 1998; Gilmour et al. 1992; Gilmour et al. 1998). Creation of estuarine microzones in a particular window of sulfate concentrations could enhance methylmercury production.

The ecological endpoint evaluated is methylmercury in the food web. Most of the foregoing discussion has been focused on net methylmercury production rates, because net methylmercury production is an important factor affecting methylmercury bioaccumulation. But the structure of the food web also is an important control on methylmercury bioaccumulation. Methylmercury bioaccumulation increases at increasing trophic levels and with increasing food web complexity. These characteristics are driven by the biomagnification of methylmercury. Methylmercury binds strongly to protein residues. Large organisms eat smaller organisms for their protein, and so retain the associated methylmercury. With every step up the food chain, mercury concentrations are found to increase, which is why large predators such as leopard sharks and striped bass have higher mercury concentrations than smaller fish like surf perch. Increasing food web complexity can also increase mercury concentrations at the top of the food web. Adding links to the food web increases the overall biomagnification of methylmercury for top-level predators. Therefore, project activities that alter ecosystem structure could affect mercury accumulation.

Factors that add to risk of increased net mercury methylation include mercury-contaminated sediments; low dissolved oxygen levels, which promote methylating bacteria and/or the breakup of oxide surfaces; water quality factors that increase mercury bioavailability to methylating bacteria; and factors that reduce the activity of demethylating bacteria and photodemethylation. Factors that increase the risk of bioaccumulation include increased food web complexity, longer-lived prey items, and shifting foraging habits of predators. Effects are complex and difficult to predict, which is why methylmercury bioaccumulation impacts would be adaptively managed.

The impact analysis also focuses on the water quality and sediment quality impacts of inorganic mercury and so considers movement and transport of total mercury along with other water quality factors that affect net methylmercury production and bioaccumulation. The Basin Plan establishes a target concentration for mercury in suspended sediment of 0.2 mg/kg mercury in dry sediment, to help support the human health and wildlife fish tissue and water quality criteria (see Table 3.3-4). Mobilization and transport of mercury-contaminated sediments into and out of the project area could cause exceedance of numeric water quality criteria or sediment quality guidelines.

The geography and history of the Bay affects the distribution of mercury-contaminated sediments within and surrounding the project area. The South Bay has been subjected to discharges of mercury-contaminated sediments originating from the historic New Almaden mining district. The mining activities causing these discharges date back to the late 1800s and early 1900s, although the discharges persist as a legacy source in the Guadalupe River watershed. The Guadalupe River Watershed Mercury TMDL is an effort to ensure that land in, around, and downstream of the New Almaden mines will be cleaned up and restored to beneficial use. However, a legacy of mercury contamination persists in the form of a north-south mercury concentration gradient in sediments in the lower South Bay (SFRWQCB 2006).

Activities that result in sediments in managed ponds and restored tidal wetlands having mercury concentrations exceeding the LTMS Guidelines (0.7 mg/kg) have the potential to cause impacts to the Bay. In this case, the potential impact is toxic effects on benthic communities, not bioaccumulation. Re-mobilization of mercury-contaminated sediments into the water column can lead to exceedance of suspended sediment targets for mercury because there is a direct relationship between the concentration of suspended sediments in the water column, the concentration of mercury on those suspended sediments, and the concentration of total mercury in the water column. Project activities could impact attainment of suspended sediment targets for mercury by changing ambient TSS or by changing the mercury concentration on suspended particles.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), existing breaches would continue to allow full tidal inundation at the Island Ponds. Continued restoration of tidal marsh habitat would import sediment from tidal waters and continue to raise pond bottom elevations. Sediment mercury concentrations in the Island Ponds are expected to be similar to concentrations found in the suspended sediments of the lower South Bay. Long-term mercury concentrations in sediment of the lower South Bay are greater than the target concentration of 0.2 mg/kg, but similar to other areas of the Bay. Sediment methylmercury concentrations in the lower South Bay are slightly elevated (see Section 3.3.1, Physical Setting). Mercury concentrations in the Bay and the Island Ponds would remain near ambient conditions and restoration of the tidal marshes would create accretional areas, resulting in a net loss of mercury from the Bay to the ponds. In addition, because continued full tidal flow in the Island Ponds would result short water residence times, methylation rates should remain low and impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, pond levees would be lowered or removed and Pond A19's northern levee would be breached to Mud Slough. These actions would increase tidal flows in Mud Slough and increase circulation between Ponds A19 and A20. Sediment mercury concentrations in Mud Slough are expected to be similar to ambient conditions because the slough is not directly connected to the Guadalupe River watershed. Potential effects from mercury and methylmercury would be similar to those discussed under Alternative Island A. Mercury concentration in the Bay, sloughs, and Island Ponds are expected to remain near ambient conditions, and water residence times would be similar or shorter. Therefore, impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative: Island C. Under Alternative Island C, levees would be lowered or removed, all three ponds would be breached to Mud Slough, existing levee breaches would be widened, and existing channels inside Pond A19 would be extended to enhance delivery of sediment to the interior of the pond. Sediment mercury concentrations in Mud Slough are expected to be similar to ambient conditions because the slough is not directly connected to the Guadalupe River watershed. Potential effects from mercury and methylmercury would be similar to those discussed under Alternative Island A. Mercury concentrations in the Bay, sloughs, and Island Ponds are expected to remain near ambient conditions and water residence times would be similar or shorter. Therefore, impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), Ponds A1 and A2W would continue to be operated with limited directional circulation, and the current use of water in Charleston Slough to supply water to Shoreline Park's sailing lake would also continue. Sediment mercury concentrations in the Mountain View Ponds are expected to be similar to concentrations found in suspended sediments of the lower South Bay because the ponds do not have a direct connection to drainage from the Guadalupe River watershed. Long-term mercury concentrations in the sediment of the lower South Bay are greater than the target concentration of 0.2 mg/kg, but similar to other areas of the Bay. Sediment methylmercury concentrations are slightly elevated.

Managed ponds could have higher rates of net methylmercury production than fully tidal systems. The large pool of easily degraded organic matter in the managed pond (from algal production) could lead to higher methylmercury concentrations in sediment, water, and biota. Labile organic matter fuels the bacteria that methylate inorganic mercury. Ponds that experience very high rates of primary production would likely benefit (in terms of lowering current methylmercury concentrations) from tidal flushing (Grenier et al. 2010).

Adaptive management would be used to monitor effects from managed ponds. Adaptive management monitoring could include methylmercury concentrations in water and biota; special studies of methylmercury production, degradation, and transport; and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when mercury concentrations of sentinel species increase substantially compared to nearby reference sites since mercury in biota can change year to year at a given site without any apparent change in management. If triggers are exceeded, then adaptive management actions would be implemented. Examples of such actions include changing hydraulic residence times or manipulating other factors depending on the specific case. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would increase tidal flows in Ponds A1 and A2W by breaching levees at several locations in Pond A2W and at one location in Pond A1. Levee breaches would allow full tidal inundation to these ponds and increase tidal flows and scour in adjacent sloughs. Although wetting and drying cycles could enhance methylmercury production, the conversion of managed ponds to fully tidal marsh would likely lessen the risk of a mercury problem within the pond. The restored tidal marsh would produce less labile organic matter than what is produced in the managed pond, providing less fuel for methylating bacteria and leading to less methylmercury production. There is, however, a potential risk associated with the remobilization of mercury-laden sediment in sloughs downstream of breaches due to scour from the increased tidal prism following reconnection of ponds to full tidal flows. This scour could increase the amount of inorganic mercury that is available for methylmercury production and uptake into the food web, at least in the short term. However, the remobilized sediment would mix with other sediment, be dispersed by the tides, and proceed through various fates of deposition, burial, or further transport (Grenier et al. 2010). Restoration of the tidal marshes would create accretional areas, eventually resulting in a net loss of mercury from the Bay to the ponds.

Adaptive management would be used to monitor effects from tidal marsh restoration. Adaptive management monitoring could include methylmercury concentrations in water and biota; special studies of methylmercury production, degradation, and transport; and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented to avoid significant impacts. Examples of such actions include capping with clean fill; removing mercury-contaminated sediments; or manipulating other factors such as encouraging development of favorable plant species. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Pond A1 would be breached at three locations, Pond A2W would be breached at four locations, and the existing levee across Charleston Slough would be breached or have its tide gates removed. These Phase 2 actions would allow full tidal inundation to Ponds A1 and A2W, increasing tidal flows and scour in adjacent sloughs. Charleston Slough would also become fully tidal.

Potential effects from mercury and methylmercury would be similar to those discussed under Alternative Mountain View B. The conversion of managed ponds to fully tidal marsh would likely lessen the risk of a mercury problem within the pond and although there would likely be short-term increases in transport of mercury-contaminated sediments, restoration of the tidal marshes would create accretional areas, eventually resulting in a net loss of mercury from the Bay to the ponds. Adaptive management would be used to monitor effects from tidal marsh restoration. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), the A8 Ponds would continue to have muted tidal exchange with Ponds A5 and A7 and also with Guadalupe Slough through the Pond A8 notch. Water exchange would be limited and managed, and the tidal range within the ponds would be muted during the dry summer and fall months.

Ponds in the Alviso pond complex along Alviso Slough, including the A8 Ponds, have elevated mercury concentrations in sediments due to deposition of mercury-laden sediments from the Guadalupe River watershed. Mercury-enriched sediment is mobilized in the upper watershed during storms and tidally mixed with ambient sediments in Alviso Slough and bayward channels. Bioavailability and bioaccumulation of mercury were found to be greater in Pond A8 than in either Alviso Slough or its fringing tidal marsh. Methylmercury concentrations in water and sediment were greater in Pond A8 than in Alviso Slough or its fringing tidal marsh channels, and biosentinels representing benthic and shoreline habitats indicated more mercury bioaccumulation in Pond A8 than in the tidal marshes along Alviso Slough (Grenier et al. 2010). As discussed above, extensive monitoring of mercury bioaccumulation in response to operational actions at Pond A8 has been ongoing.

The large pool of easily degraded organic matter (from algal production) in Pond A8 is most likely the driving force that leads to higher methylmercury concentrations in Pond A8 sediment, water, and biota. In contrast, the organic matter associated with Alviso Slough and the fringing marsh is largely terrestrial in nature and much less easily degraded by bacteria, presumably leading to overall lower rates of microbial activity and methylmercury production. There are also layers of sediment with relatively high concentrations of total mercury buried beneath Alviso Slough that could be exhumed by tidal scour. This scour could increase the amount of inorganic mercury that is available for methylmercury production and uptake into the food web, at least in the short term within Alviso Slough and Pond A8. Remobilized sediment would mix with other sediment; be dispersed by the tides; and proceed through various fates of deposition, burial, or further transport (Grenier et al. 2010). The Pond A8 actions are not expected to result in mobilization of mercury because the mercury concentrations in the upland fill that that would be placed above the tidal zone would be screened to ensure that the fill meets guidelines for reuse. In addition, the fill to be placed would likely cover older sediment with higher concentrations of mercury.

Adaptive management measures have been and will continue to be used to monitor effects from the A8 Ponds. Adaptive management monitoring could include methylmercury concentrations in water and sediments; special studies of methylmercury production, degradation, and transport; and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when mercury concentrations of sentinel species increase substantially, compared to the reference site, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented. Examples of such actions include changing hydraulic residence times or manipulating other factors. Because of the factors described above, impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, Phase 2 actions would include import of clean sediment to Pond A8S's southwest and/or southeast corner. This import of sediment would not change water levels in the A8 Ponds or interfere with water circulation. Potential effects from mercury and methylmercury would be similar to those discussed under Alternative A8 A. Adaptive management would be used to monitor effects from tidal marsh restoration. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new activities would be implemented as part of Phase 2, and Ponds R3, R4 and R5/S5 would continue to function as seasonal ponds. Although the Ravenswood Ponds are known to have—or are expected to have—mercury concentrations below ambient conditions in the Bay, water would not be discharged from the ponds. Therefore, there would be little to no effects to water or sediment quality in adjacent sloughs or the Bay, and impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to Ravenswood Slough to allow full tidal inundation, and Pond R3 would remain a seasonal pond, but a water control structure would be installed on it to allow inflow from Ravenswood Slough to improve forage habitat for western snowy plover. Ponds R5 and S5 would be converted from seasonal ponds to managed ponds through the construction of water control structures and some earthmoving.

The Ravenswood Ponds are known to have mercury concentrations below ambient conditions in the Bay. Therefore, opening the seasonal ponds to full tidal flows or directional circulation would likely introduce additional mercury-contaminated sediments from the Bay into the ponds. Adaptive management would be used to monitor effects on managed ponds and restored tidal wetlands. Adaptive management actions would be triggered when mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would have similar effects to those described for Alternative Ravenswood B, with the following exceptions: Pond R4 would also be breached to the channel between it and Greco Island, Ponds R5 and S5 would be converted to managed mudflats, and water control structures would be installed on Pond R3 to allow inflow to improve forage habitat for western snowy plover. The water control structure connecting Pond R3 to Ravenswood Slough would be opened only during the incoming time to reduce potential discharges.

Potential effects from mercury and methylmercury would be similar to those discussed under Alternative Ravenswood B. Adaptive management would be used to monitor effects to managed ponds and restored tidal wetlands. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, remove levees within and between Ponds R5 and S5, convert Ponds R5 and S5 to enhanced managed ponds, allow stormwater outflow from Redwood City to Ponds R5 and S5, and install water control structures on Pond R3. The water control structure connecting Pond R3 to Ravenswood Slough would be opened only during the incoming tide to reduce potential discharges.

Potential effects from mercury and methylmercury would be similar to those discussed under Alternative Ravenswood B. Adaptive management would be used to monitor effects to managed ponds and restored tidal wetlands. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.3-4: Potential impacts to water quality from other contaminants.

The proposed alternatives for Phase 2 of the SBSP Restoration Project have the potential to affect water and sediment quality with various constituents other than mercury, methylmercury, and dissolved oxygen. This section describes the primary mechanisms that could impair water and sediment quality by introduction of these other contaminants. The following program-wide comprehensive design measures are also incorporated into all of the project alternatives.

Actions to Address Increased Mobilization and Transport of Particle-Associated Contaminants. Concentrations of particle-associated “legacy” pollutants, such as PCBs and organochlorine pesticides (e.g., DDT and chlordanes), that were deposited during the times of their historic peak use are often substantially higher in subsurface sediments than surface sediments. It is expected that areas of increased tidal action would result in scour of tidal sloughs and channels. Levee breaching, scour of undersized channels, and increased tidal mixing could lead to temporary increased turbidity and the mobilization and transport of contaminated surface and subsurface sediments. Turbidity increases and contaminant mobility could lead to deposition of such contaminated sediments in restored areas of biological use.

Because of the spatial gradients for mercury and other sediment-associated contaminants (e.g., PCBs, PAHs), it is important to recognize that breaching levees would always have the effect of either releasing contaminant loads from the restored tidal marshes and managed ponds into the Bay or from the Bay into the restored tidal marshes and managed ponds, unless sediment contaminant concentrations are identical in ponds and the Bay. Most of the ponds would be expected to have lower concentrations of urban-associated pollutants such as PCBs and copper in their sediments, because they have been largely cut off from Bay sediments during the past 100 years of industrialization and urbanization. Conversion of ponds to tidal habitat involves accumulation of sediment in the restored ponds, which would cause net losses of particle-associated pollutants from the Bay to the restored ponds.

Sediment monitoring data will be used to determine appropriate disposal or beneficial re-use practices for sediments. If sediment monitoring data indicate that tidal scour outside a levee breach could remobilize sediments that are significantly more contaminated than Bay ambient conditions, the SBSP Restoration Project will consult with the appropriate regulatory agencies regarding other potential required actions.

Actions to Minimize Illegal Discharge and Dumping. State law prohibits littering, and all municipalities in and around the project area have anti-littering ordinances. Implementation of state programs, including stormwater permits, will ensure monitoring for trash and trash abatement measures. Adverse water quality impacts may result from illegal discharges and illicit dumping from the general public as a result of increasing public access to the project area. These discharges or dumping could vary in size and may consist of liquid or solid wastes.

The SBSP Restoration Project will undertake the following activities to ensure that existing programs and practices avoid impacts due to illegal discharge and dumping:

- Gate structures upstream of the SBSP Restoration Project area will include a trash capture device that will prevent fouling of marsh and pond complexes.
- Plans for recreational access in the SBSP Restoration Project area will include appropriate trash collection receptacles and a plan for ensuring regular collection and servicing.
- “No Littering” signs will be posted in public access areas.

Urban Runoff Management. Increased exchange of urban runoff with restored tidal marshes and managed ponds (via tide gates connected to flood control channels or through direct diversion) could transport and/or deposit contaminants, including trash, from urban sources into the restored areas. Urban runoff in the South Bay has been shown to have contaminants such as PAHs, metals (copper and zinc), and urban pesticides (diazinon, pyrethroids) (McKee et al. 2006). Restored tidal marshes and managed ponds could sequester urban pollutants, thereby reducing overall pollutant loads from urban runoff to the Bay. However, the sequestering of urban pollutants in the biologically active restored areas could also render the pollutants more available to biological uptake. The project proponents will notify the appropriate urban runoff program of any physical changes (such as breaches) that will introduce urban discharges into the project area and request that the urban runoff program consider those changes when developing annual monitoring plans.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), existing breaches would continue to allow full tidal inundation at the Island Ponds. Although these breaches would continue to be monitored through special studies, levees and other features at the Island Ponds would not be maintained, with the exception of the Union Pacific Railroad (UPRR) tracks (the maintenance of which is not a component of this project).

Tidal flows could mobilization and transport sediments containing legacy pollutants within the watershed. However, it is unlikely that implementation of Alternative Island A would result in the exceedances of any thresholds discussed above at a frequency greater than under existing conditions. Therefore, impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, pond levees would be lowered or removed and Pond A19's northern levee would be breached to Mud Slough. These actions would increase tidal flows in Mud Slough and increase circulation between Ponds A19 and A20. Ongoing operation and maintenance (O&M) activities would not occur at the Island Ponds, with the exception of those discussed under Alternative Island A.

Construction Related Activities. Construction-related activities could lead to transient adverse water quality impacts during or shortly after the period of construction. Breaching or lowering levees could affect water and sediment quality and result in short-term increases in turbidity. Construction activities would also bring equipment and materials not normally present in the project area onto the site. These activities would increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents or equipment malfunction or maintenance. With proper management and oversight, impacts associated with construction activities should not result in exceedances of any thresholds of significant impact. Also, it is unlikely that the impacts associated with mobilization and transport of contaminated sediment would be of a sufficient magnitude or extent as to cause exceedances of the thresholds identified after mitigation. Programmatic Mitigation Measure 3.3-4a applies to Alternative Island B.

Programmatic Mitigation Measure 3.3-4a: Storm Water Pollution Prevention Plan. This measure will mitigate potential impacts due to construction-related activities and maintenance activities. The project sponsors will obtain authorization from the SFRWQCB before beginning construction. As part of this application, the project sponsors will prepare a Storm Water Pollution Prevention Plan (SWPPP) and require all construction contractors to implement the Best Management Practices (BMPs) identified in the SWPPP for controlling soil erosion and discharges of other construction-related contaminants. Routine monitoring and inspection of BMPs will be conducted to ensure that the quality of stormwater discharges is in compliance with the permit. BMPs that will appear in the SWPPP include:

- Soil stabilization measures, such as preservation of existing vegetation to minimize soil disturbance;
- Sediment control measures to prevent disturbed soils from entering waterways;
- Tracking control measures to reduce sediments that leave the construction site on vehicle or equipment tires; and
- Nonstormwater discharge control measures, such as monitoring hazardous material delivery, storage, and emergency spill response requirements, and measures by the project sponsors to ensure that soil-excavation and movement activities are conducted in accordance with standard BMPs regarding excavation and dredging of bay muds, as outlined in the San Francisco Bay Conservation and Development Commission's (BCDC's) bay dredge guidance documents. These BMPs include excavating channels during low tide; using dredge equipment, such as sealing clamshell buckets, designed to minimize escape of the fine-grained materials; and testing dredge materials for contaminants.

The contractor will select specific BMPs from each area, with project sponsor approval, on a site-specific basis. The construction general contractor will ensure that the BMPs are implemented as appropriate throughout the duration of construction and will be responsible for subcontractor compliance with the SWPPP requirements.

Other impacts due to construction-related and maintenance activities can be mitigated by appropriate additions to the SWPPP, including a plan for safe refueling of vehicles and spill containment plans. An appropriate hazardous materials management plan will be developed for any activity that involves handling, transport, or removal of hazardous materials.

Potential effects to water quality from contaminants would be similar to those discussed under Alternative Island A. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts to less-than-significant levels.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, levees would be lowered or removed, all three ponds would be breached to Mud Slough, existing levee breaches would be widened, and existing channels inside Pond A19 would be extended to enhance delivery of sediment to the interior of the pond. Potential effects to water quality from contaminants would be similar to those discussed under Alternative Island A. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts to less-than-significant levels.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), Ponds A1 and A2W would continue to be operated with limited directional circulation and the current use of water in Charleston Slough to supply water to Shoreline Park's sailing lake would also continue.

Surface Water Contamination from Groundwater. Because surface water and groundwater are in at least partial hydraulic communication, shallow groundwater could seep into the ponds or restored tidal habitat or the surrounding sloughs and Bay. Although there are numerous fuel and solvent spills affecting the shallow aquifers in industrialized areas of the South Bay, the plumes are generally at least a mile from the salt ponds, with the exception of those at the Moffett Federal Airfield area, which is in the vicinity of the Mountain View Ponds. None of the proposed alternatives for the SBSP Restoration Project are expected to substantially affect either horizontal or vertical groundwater gradients (and resulting groundwater flows) in the area, so the project would not affect the concentrations or the migration rates or directions of plume migration compared to baseline conditions. Also, the water management agencies (primarily SCVWD) and the SFRWQCB (as well as DTSC and the counties) have coordinated programs that together ensure that fuel and solvent spills are identified, contained, and remediated in such a way that neither the ecosystem nor surface water resources are impacted by groundwater contamination.

Maintenance-Related Activities. Although construction activities would not occur under Alternative Mountain View A, hazards could result from the routine maintenance activities required for managed ponds and public access facilities; these activities may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. The project proponents would implement the control measures specified in the project's waste discharge permit (Water Quality Order No. R2-2008-0078, as revised by R2-2012-0014, or current version). Provisions include specifications for repair, replacement, and servicing of existing facilities, dredging and placement of dredge and/or imported fill material on existing levees, placement of riprap, and general maintenance activities. Implementation of control measures for O&M activities would ensure that impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would increase tidal flows in Ponds A1 and A2W by breaching levees at several locations in Pond A2W and at one location in Pond A1. Levee breaches would allow full tidal inundation to these ponds and increase tidal flows and scour in adjacent sloughs. Alternative Mountain View B would also include raising levees and importing fill material for habitat transition zones.

Construction and Maintenance-Related Activities. Construction-related activities can lead to transient adverse water quality impacts during or shortly after the period of construction. Construction activities that could affect water and sediment quality include placement and grading of levee fill, placement of fill material for habitat transition zones, breaching levees, and construction of hardened crossings; these activities could result in short-term increases in turbidity. Construction activities would increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents, equipment malfunction, or maintenance. Hazards could also result from the routine maintenance activities required for the ponds and public access facilities; these activities may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen would be similar to those discussed under Alternative Island B and Alternative Mountain View A. With proper management and oversight, impacts associated with construction activities should not result in exceedances of any thresholds of significant impact. Also, it is unlikely that the impacts associated with mobilization and transport of contaminated sediment would be of a sufficient magnitude or extent as to cause exceedances of the thresholds identified after mitigation. Programmatic Mitigation Measure 3.3-4a applies to Alternative Mountain View B.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Pond A1 would be breached at three locations, Pond A2W would be breached at four locations, and the existing levee across Charleston Slough would also be breached or have its tide gates removed. These Phase 2 actions would allow full tidal inundation to Pond A1, Pond A2W, and Charleston Slough, increasing tidal flows and scour in adjacent sloughs. Alternative Mountain View C would also include raising levees and importing fill material for habitat transition zones.

Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen would be similar to those discussed under Alternatives Mountain View A and Mountain View B.

Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts to less-than-significant levels.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), the A8 Ponds would continue to have muted tidal exchange with Ponds A5 and A7 and with Guadalupe Slough through the Pond A8 notch. Water exchange would be limited and managed, and the tidal range within the ponds would be muted during the dry summer and fall months.

Maintenance-Related Activities. Although construction activities would not occur under Alternative A8 A, hazards could result from the routine maintenance activities required for the managed ponds, which may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. The project proponents would implement the control measures specified in the project's waste discharge permit (Water Quality Order No. R2-2008-0078, as revised by R2-2012-0014, or current version). Provisions include specifications for repair, replacement, and servicing of existing facilities, dredging and placement of dredge and/or imported fill material on existing levees, placement of riprap, and general maintenance activities. Implementations of control measures for O&M activities would ensure that impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, Phase 2 actions would include import of clean sediment to the southwest and/or southeast corner of Pond A8S. This action would not change water levels in the A8 Ponds or interfere with water circulation.

Construction and Maintenance Activities. Construction-related activities could lead to transient adverse water quality impacts during or shortly after the period of construction. Construction of habitat transition zones could result in short-term increases in turbidity. Construction activities would increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents, equipment malfunction, or maintenance. Potential effects to water quality from maintenance-related activities would be similar to those discussed under Alternative A8 A. With proper management and oversight, impacts associated with construction activities should not result in exceedances of any thresholds of significant impact. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts from construction-related activities to less-than-significant levels.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new activities would be implemented as part of Phase 2 and Ponds R3, R4 and R5/S5 would continue to function as seasonal ponds.

Maintenance-Related Activities. Although construction activities would not occur under Alternative Ravenswood A, hazards could result from the routine maintenance activities, which may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. The project proponents would implement the control measures specified in the project's waste discharge permit (Water Quality Order No. R2-2008-0078, as revised by R2-2012-0014, or current version). Provisions include specifications for repair, replacement, and servicing of existing facilities, dredging and placement of dredge and/or imported fill material on existing levees, placement of riprap, and general maintenance activities. Implementations of control measures for O&M activities would ensure that impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to Ravenswood Slough to allow full tidal inundation, and Pond R3 would remain a seasonal pond, but a water control structure would be added to allow inflow to improve forage habitat for western snowy plover. Ponds R5 and S5 would be converted from seasonal ponds to managed ponds through the construction of water control structures and some earthmoving. Levees would be improved, lowered, or removed and a habitat transition zone would be constructed in Pond R4.

Construction and Maintenance-Related Activities. Construction-related activities could lead to transient adverse water quality impacts during or shortly after the period of construction. Levee breaches, modifications to levee heights, and construction of habitat transition zones could result in short-term increases in turbidity. Construction activities would increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents, or equipment malfunction or maintenance. Potential effects to water quality from maintenance-related activities would be similar to those discussed under Alternative Ravenswood A. With proper management and oversight, impacts associated with construction activities would not result in exceedances of any thresholds of significant impact. Also, it is unlikely that the impacts associated with mobilization and transport of contaminated sediment would be of a sufficient magnitude or extent as to cause exceedances of the thresholds identified after mitigation. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts from construction-related activities to less-than-significant levels.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would have similar effects to those described for Alternative Ravenswood B, with the following exceptions: Pond R4 would also be breached to the channel between it and Greco Island, Ponds R5 and S5 would be converted to managed mudflats, and water control structures would be installed on Pond R3 to allow inflow to improve forage habitat for western snowy plover. Levees would be improved, lowered, or removed and a habitat transition zone would be constructed in Pond R4.

Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen would be similar to those discussed under Alternative Ravenswood B. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce impacts to less-than-significant levels.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, remove levees within and between Ponds R5 and S5, convert Ponds R5 and S5 to enhanced managed ponds, allow stormwater outflow from Redwood City to Ponds R5 and S5, and install water control structures on

Pond R3. Levees would be improved, lowered, or removed and a habitat transition zone would be constructed in Pond R4.

Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen would be similar to those discussed under Alternative Ravenswood B, with the exception that stormwater inflow from the Bayfront Canal could be discharged into Ponds R5 and S5. The Bayfront Canal is the stormwater transmission canal for Atherton Channel that discharges through Flood Slough and into the Bay. Peak stormwater flows would be temporarily routed from the Bayfront Canal and Atherton Channel into Ponds R5 and S5.

Increased exchange of urban runoff with restored tidal marshes and managed ponds (via tide gates or other water control structures connected to flood control channels or through direct diversion) could transport and/or deposit sediments and contaminants, including trash, from urban sources into the restored areas. However, the water control structure used to divert stormwater flows into Ponds R5 and S5 would generally allow the first flush of the storm, which often has higher concentrations of urban pollutants, to pass by the ponds. The quality of the stormwater would be managed as part of Redwood City's municipal separate storm sewer system (MS4) permit and in accordance with the Water Quality Monitoring Plan that the City of Redwood City is developing for this project. That plan will include monitoring of stormwater flows in Bayfront Canal prior to diversion into Ponds S5 and R5, installation of trash racks, and an operations plan that would only divert the peak runoff (i.e., after the first flush of the storm) into the restoration area. Therefore, adverse impacts to the ponds would be minimized. Implementation of Programmatic Mitigation Measure 3.3-4a would reduce construction impacts to less-than-significant levels.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.3-5: Potential to cause seawater intrusion of regional groundwater sources.

Factors associated with the risk of future salinity intrusion include improperly abandoned wells and salinity migration into areas with poorly confined aquifers. Migration of Bay waters up creeks and sloughs was documented as a historical cause of salinity intrusion, and artificial pathways increase the risk of seawater intrusion into regional groundwater supplies. As described in Section 3.3.1, Physical Setting, historic overdraft conditions during the early- to mid-1900s that lowered groundwater levels have been reversed over the past 40 years. Today, water flows from groundwater basins into the Bay. As long as that condition persists, there is no significant risk of salinity intrusion into drinking water aquifers.

Management of Abandoned Wells. The management of abandoned wells is a program-wide comprehensive design measure incorporated into all Action Alternatives. If any abandoned wells are found before or during construction, they will be properly destroyed by the project as per local and state regulations by coordinating such activities with the local water district. If abandoned wells are located during restoration or other future activities within SCVWD boundaries, a well destruction work plan will be prepared in consultation with SCVWD (as appropriate) to ensure conformance to SCVWD specifications. The work plan will include consulting the databases of well locations already provided by SCVWD. The project will properly destroy both improperly abandoned wells and existing wells within the project area that are subject to inundation by breaching levees. Well destruction methods will meet local, county, and state regulations. The project proponents will also lend support and cooperation with any well identification and destruction program that may be undertaken as part of the U.S. Army Corps of Engineers' Shoreline Study or other projects

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), the Island Ponds would continue to have tidal inundation. Tidal inundation of ponds with water levels that are currently at or near mean sea level would not result in significant changes in groundwater hydrology. Continued tidal inundation would not cause a salinity gradient to migrate landward, as compared to existing conditions. Impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Potential effects of Alternative Island B would be similar to those discussed under Alternative Island A. Impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Potential effects of Alternative Island C would be similar to those discussed under Alternative Island A. Impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), the Mountain View Ponds would continue to be operated for directional circulation. Managed ponds with water levels that are somewhat below mean sea level would not result in significant changes in groundwater hydrology. Impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Ponds A1 and A2W would be opened to full tidal flows. Tidal inundation of managed ponds with water levels that are currently somewhat below mean sea level would not result in a significant change in groundwater hydrology. Although the increased tidal prism would draw Bay waters through the sloughs to the breach locations, Mountain View Slough and Whisman Slough are likely to already have similar salinities as the open waters at these locations because of close proximity to the Bay, except during storm events. The salinity in upstream creeks is not expected to change substantially, and groundwater currently has positive flow into the Bay. Impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. The potential effects of seawater intrusion to regional groundwater sources under Alternative Mountain View C would be similar to those discussed under Alternative Mountain View B. Impacts would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), the A8 Ponds would continue to be operated for muted tidal circulation. Managed ponds with water levels that are currently at or near sea level would not result in substantial changes in groundwater hydrology. Impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. The potential effects of Alternative A8 B would be similar to those discussed under Alternative A8 A. Impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Phase 2 Ravenswood Ponds would continue to be operated as seasonal ponds, with little to no exchange with adjacent sloughs or the Bay. Impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. The flooding of seasonal ponds would provide beneficial changes in pond salinity. Salinity in tidally inundated ponds would continue to decline to concentrations comparable to the Bay. The flooding of seasonal ponds would not cause any significant change in the horizontal or vertical hydraulic gradients. A change of a 5 feet or less is not likely to be enough to change the direction of either horizontal flow or vertical flow, since groundwater levels generally fluctuate several feet in a normal year.

Prior hydrodynamic modeling results for salinity indicate that salinity would not increase substantially in the Ravenswood pond complex (2007 EIS/R, Appendix J). Therefore, the risk of salinity intrusion from stream channel modifications or operational changes would be minimal. Breaching of levees and tidal inundation of low-lying ponds could pose a risk of seawater intrusion if such actions were to inundate improperly abandoned wells and groundwater overdraft occurs in the future. However, program-wide design measures include management of abandoned wells (described above). Therefore, impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative: Ravenswood C. The potential effects of Alternative Ravenswood C would be similar to those discussed under Alternative Ravenswood B. Impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The potential effects of Alternative Ravenswood D would be similar to those discussed under Alternative Ravenswood B. Impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Impacts, mitigation measures, and the level of significance after mitigation are summarized in Table 3.3-6. With the incorporation of mitigation, all impacts would be less than significant.

Table 3.3-6. Phase 2 Summary of Impacts – Water Quality

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.3-1: Degradation of water quality due to changes in algal abundance or composition.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-2: Degradation of water quality due to low dissolved oxygen levels.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-3: Degradation of water quality due to increased methylmercury production or mobilization of mercury-contaminated sediments.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-4: Potential impacts to water quality from other contaminants.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-5: Potential to cause seawater intrusion of regional groundwater sources.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
LTS = Less than Significant

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3.4 Geology, Soils, and Seismicity

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) characterizes the existing geology and soils within the Phase 2 project area, and assesses whether implementation of the project would cause a substantial adverse effect on geology and soils. The information presented is based on a review of existing geology and soil conditions within the area, and other pertinent federal, state, and local regulations, which are presented in the regulatory framework setting section. Using this information as context, an analysis of the project's environmental impacts related to geology and soils is presented for each alternative. Programmatic mitigation measures described in Chapter 2, Alternatives, would be implemented as part of the project-level designs. Therefore, this section only includes additional mitigation measures as needed.

3.4.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). The baseline condition specific to the Phase 2 area pond clusters is based on the current condition of these areas.

Geologic, seismic, and soil characteristics for the South San Francisco Bay (South Bay) were evaluated using existing published data and other publicly available sources and are summarized in the 2007 EIS/R. The sources and references for that evaluation include maps of general geologic distribution, faults, soils, liquefaction susceptibility, and other characteristics and are listed in that 2007 document.

Regional Setting

The regional setting for the SBSP Restoration Project as a whole was presented in Chapter 3.5 of the 2007 EIS/R. The following excerpts present an overview of key geologic, seismic, soils, and hazards concepts. A discussion of these concepts as they relate to the existing conditions at each Phase 2 pond cluster is provided below.

Geology

The San Francisco Bay Region is located along the boundary between the Pacific and North American plates, two large crustal plates that are separated by the north-northwest-trending San Andreas Fault, within the California Coast Ranges Geomorphic Province. A map showing an overview of geology in the San Francisco Bay Area from the United States Geological Survey is shown on Figure 3.4-1 (Wentworth 1997). The geomorphology of the region includes parts of three prominent, northwest-trending geologic/geomorphic features, which include, from west to east, the Santa Cruz Mountains, the Santa Clara Valley, and the Diablo Range. The Santa Clara Valley forms part of an elongated structural block (the San Francisco Bay block) within the central Coast Ranges that contains San Francisco Bay and its surrounding alluvial margins. This structural block is bounded by the San Andreas Fault to the southwest and the Hayward-Calaveras Fault zone to the northeast.

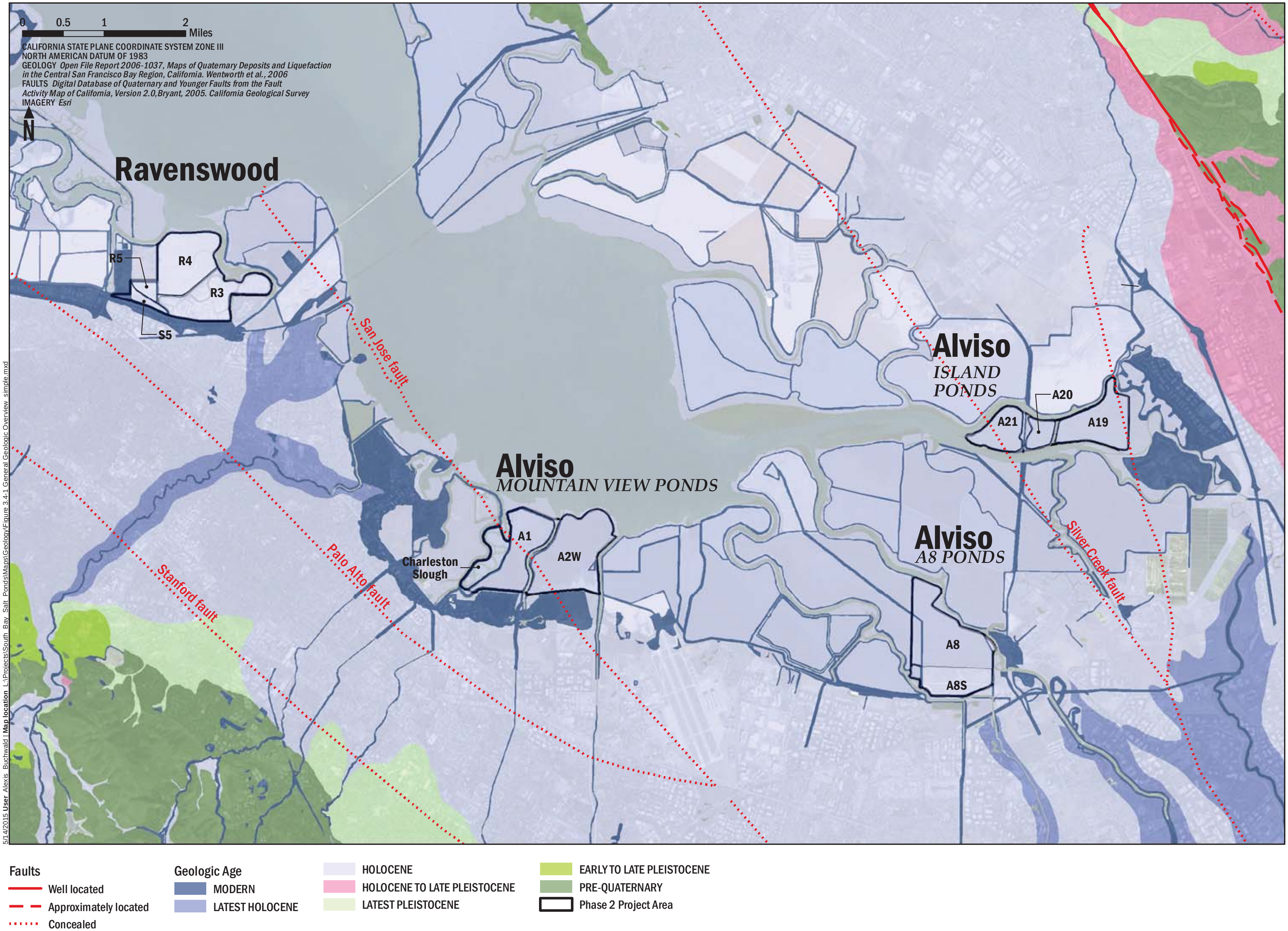

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Figure 3.4-1
General Geological Overview

The oldest rocks in the region belong to the Franciscan Complex of Jurassic to Cretaceous age (205 to 65 million years ago [Ma]). These rocks are intensely deformed (i.e., folded, faulted, and fractured) due to ancient tectonic processes and, to a lesser extent, from more recent tectonic processes associated with the San Andreas Fault system. Franciscan rocks generally comprise the “basement” of the Coast Ranges northeast of the San Andreas Fault; Cretaceous granitic rocks, known as the Salinian block, comprise the basement of the ranges located southwest of the San Andreas Fault. A sequence of Tertiary (65 to 1.8 Ma) marine and nonmarine sedimentary rocks unconformably overlies the granitic and Franciscan basement rocks in the region.

During the Plio-Pleistocene (5 Ma to 11,000 years ago [ka]) epochs, sediments eroded from the uplifting Diablo Range and the Santa Cruz Mountains formed broad alluvial fan complexes along the margins of the Santa Clara Valley. The 5-Ma to 300,000-year-old (Plio-Pleistocene) Santa Clara Formation, which consists of a sequence of fluvial and lacustrine sediments, was deposited unconformably on the older Tertiary and Franciscan rocks along the margins of the Santa Clara Valley during this time and has subsequently folded, faulted, and eroded. The Santa Clara Formation is unconformably overlain by younger Quaternary and Holocene (11 ka to present) alluvial and fluvial deposits (stream channel, overbank, and flood basin environments), which interfinger to the north with estuarine muds of San Francisco Bay (Helley et al. 1979).

South San Francisco Bay is a north-northwest-trending subsiding basin that is filled primarily with Quaternary alluvium (stream) deposits eroded from the surrounding margins and estuarine sources (Bay mud). The Sangamon and Holocene Bay muds are separated by the Quaternary alluvium and eolian (wind-blown) sand deposits. Alluvium deposits consist of sediments eroded from the surrounding Santa Cruz Mountains and Diablo Range uplands. These alluvial sediments were transported and deposited by streams and include a mixture of sands, gravels, silts, and clays with highly variable permeability. In contrast, the fine-grained Bay muds have very low permeability. The youngest Holocene Bay muds underlie almost the entire original Bay (Atwater et al. 1977; Helley et al. 1979). Figure 3.4-2 shows Bay mud thickness in the South San Francisco Bay Area (McDonald et al. 1978). Estuarine (Bay) muds were deposited in San Francisco Bay during high sea level periods of the Sangamon (70,000 to 130,000 years ago) and the Holocene (less than 11,000 years ago) (Atwater et al. 1977).

Soils

According to soil surveys published by the U.S. Department of Agriculture (USDA) Soil Conservation Service, soils along the Bay on the San Francisco Peninsula generally consist of those typically found on bottom lands, and can vary from very poorly drained to well drained (Figure 3.4-3).

Faults

The San Francisco Bay Region is located within a very broad zone of right-lateral transpression (strike-slip faulting and compression) marking a tectonic boundary zone dominated by strike-slip faulting associated with the San Andreas Fault system. The major active components of the San Andreas Fault system that occur in the South San Francisco Bay Region include the proper or main trace of the San Andreas, Hayward, and Calaveras Faults. Fault locations are shown on Figure 3.4-1.

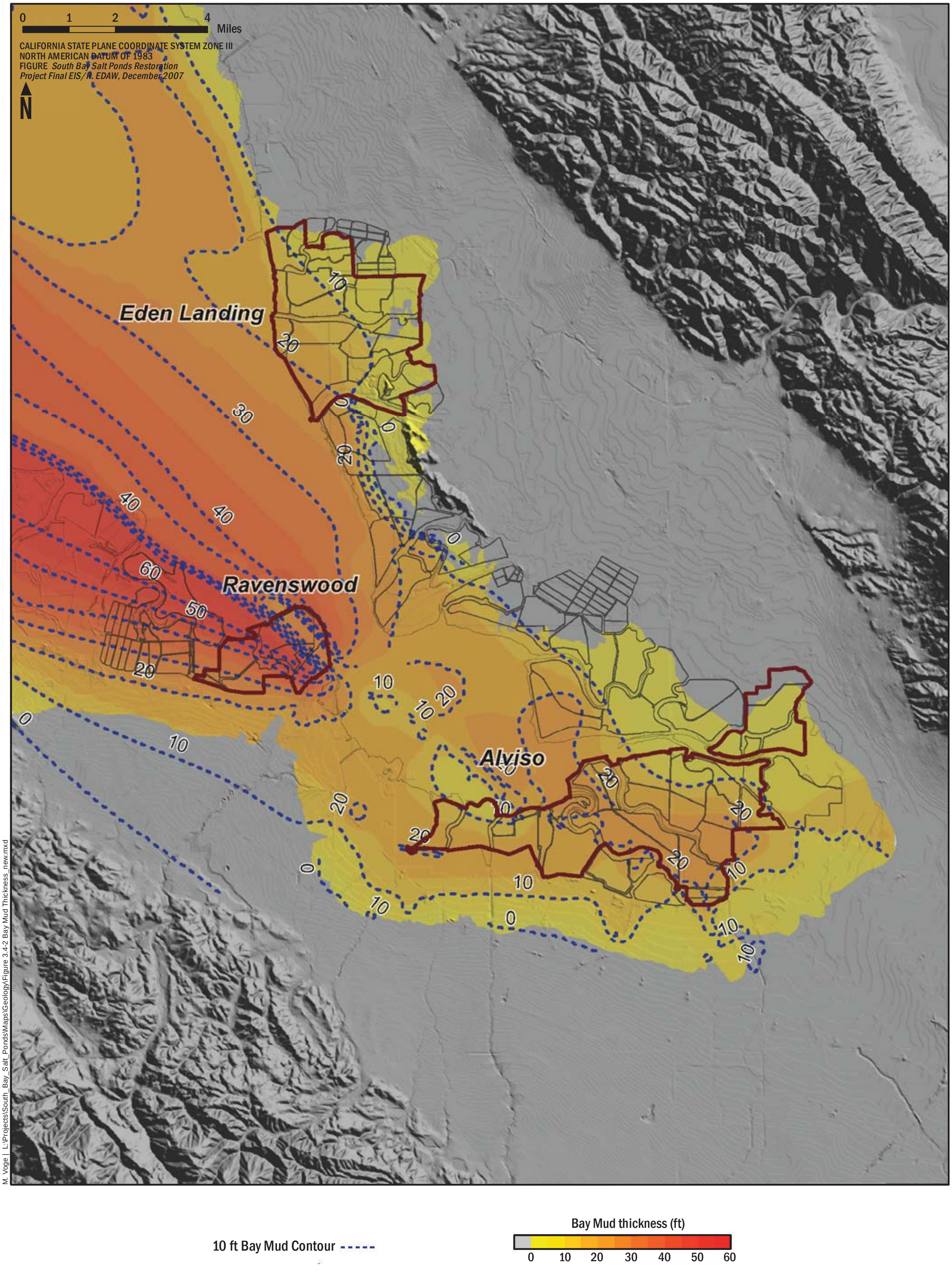

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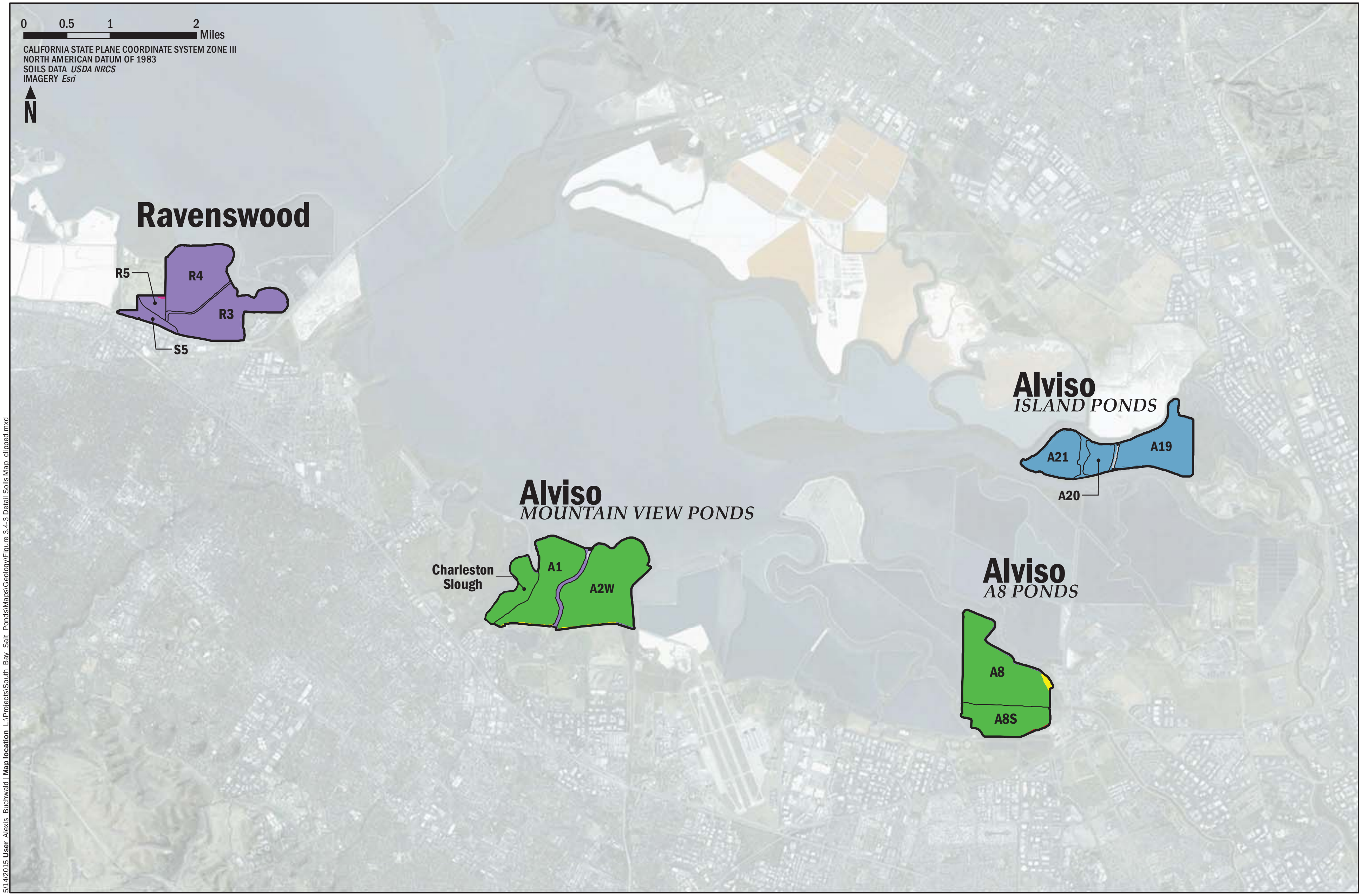
Figure 3.4-2
Bay Mud Thickness within the SBSP Restoration Project Area



Phase 2 Project Area

NRCS Detailed Soils
- Aquic Xerorthents
- Novato clay
- Novato silty clay loam
- Pits and Dumps
- Reyes clay
- Xerorthents

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Figure 3.4-3
Soils

Seismicity and Seismic Hazards

The San Francisco Bay Region is considered to be one of the more seismically active regions in the world, based on its record of historic earthquakes and its position along the San Andreas Fault system. The San Andreas Fault system consists of several major right-lateral strike-slip faults in the region that define the boundary zone between the Pacific and North American tectonic plates. Numerous damaging earthquakes have occurred along the San Andreas Fault as well as other regional faults in historical time.

Seismic or earthquake hazards are generated by the release of underground stress along a fault line and can cause ground shaking, surface fault rupture, tsunami/seiche generation, liquefaction, and earthquake-induced landsliding.

Surface Fault Rupture

Surface fault rupture, which is a manifestation of the fault displacement at the ground surface, usually is associated with moderate- to large-magnitude earthquakes (magnitudes of about 6 or larger). Generally, primary surface fault rupture occurs on active faults having mappable traces or zones at the ground surface. Potential surface fault rupture hazards exist along the known active faults in the greater San Francisco Bay Region. As shown on Figure 3.4-1, the faults that have been identified by the California Geologic Survey as potential surface rupture hazards in close proximity to the South Bay include the San Andreas and Hayward Faults. These faults show historic (last 200 years) displacement associated with mapped surface rupture or surface creep. Other faults in the South Bay include concealed, potentially active Quaternary faults with evidence of displacement sometime during the past 1.8 million years. The San Jose and Palo Alto Faults are mapped on the western boundary of the Bay. The San Jose Fault passes just east of northern portions of the Phase 2 area. The Silver Creek Fault, which is mapped on the eastern margin of the Bay, is located within the Phase 2 area.

Ground Shaking

Ground shaking takes the form of complex vibratory motion in both the horizontal and vertical directions. The amplitude, duration, and frequency content of ground shaking experienced at a specific site in an individual earthquake are highly dependent on several factors, including the magnitude of the earthquake, the fault rupture characteristics, the distance of the fault rupture from the site, and the types and distributions of soils beneath the site. Large-magnitude earthquakes produce stronger ground shaking than small-magnitude events. Sites close to the zone of fault rupture typically experience stronger motion than similar sites located farther away. Site soils can amplify ground motion in certain frequency ranges and can dampen ground motion within other frequency ranges. Soft soils sites, such as the Holocene Bay Mud and Quaternary alluvium, eolian deposits, and older Pleistocene Bay mud could amplify ground motions in the long period range compared to stiff or firm soils sites. This would affect structures having long, natural periods of vibration, such as bridges and tall buildings. Such soft soils are located in the Phase 2 area.

Liquefaction and Related Ground Failures

Liquefaction is a soil behavior phenomenon in which a soil located below the groundwater surface loses a substantial amount of strength due to high excess pore-water pressure generated and accumulated during strong earthquake ground shaking. During earthquake ground shaking, induced cyclic shear creates a tendency in most soils to change volume by rearrangement of the soil-particle structure. The potential for excess pore-water pressure generation and strength loss associated with this volume change tendency is highly dependent on the density of the soil, with greater potential in looser soils like those surrounding South San Francisco Bay including the Phase 2 project area.

The severity of the liquefaction hazard depends on: density of the saturated granular soils, depth and thickness of potentially liquefiable layers, magnitude and duration of the ground shaking, and distance to the nearby free face or ground slope. Generally, looser deposits have the potential to densify more as a result of ground shaking and are subject to larger volumetric changes. Generally thicker deposits would accumulate more volumetric change than thinner deposits.

Figure 3.4-4 shows liquefaction susceptibility based on subsurface conditions, including soil type, soil thickness, and depth to groundwater. Locations of observed ground effects (lateral spreading, sand boil, or settlement) from historic earthquakes (1989 Loma Prieta, 1906 San Francisco, and others) are also shown.

Landslides and Earthquake Triggered Landslides

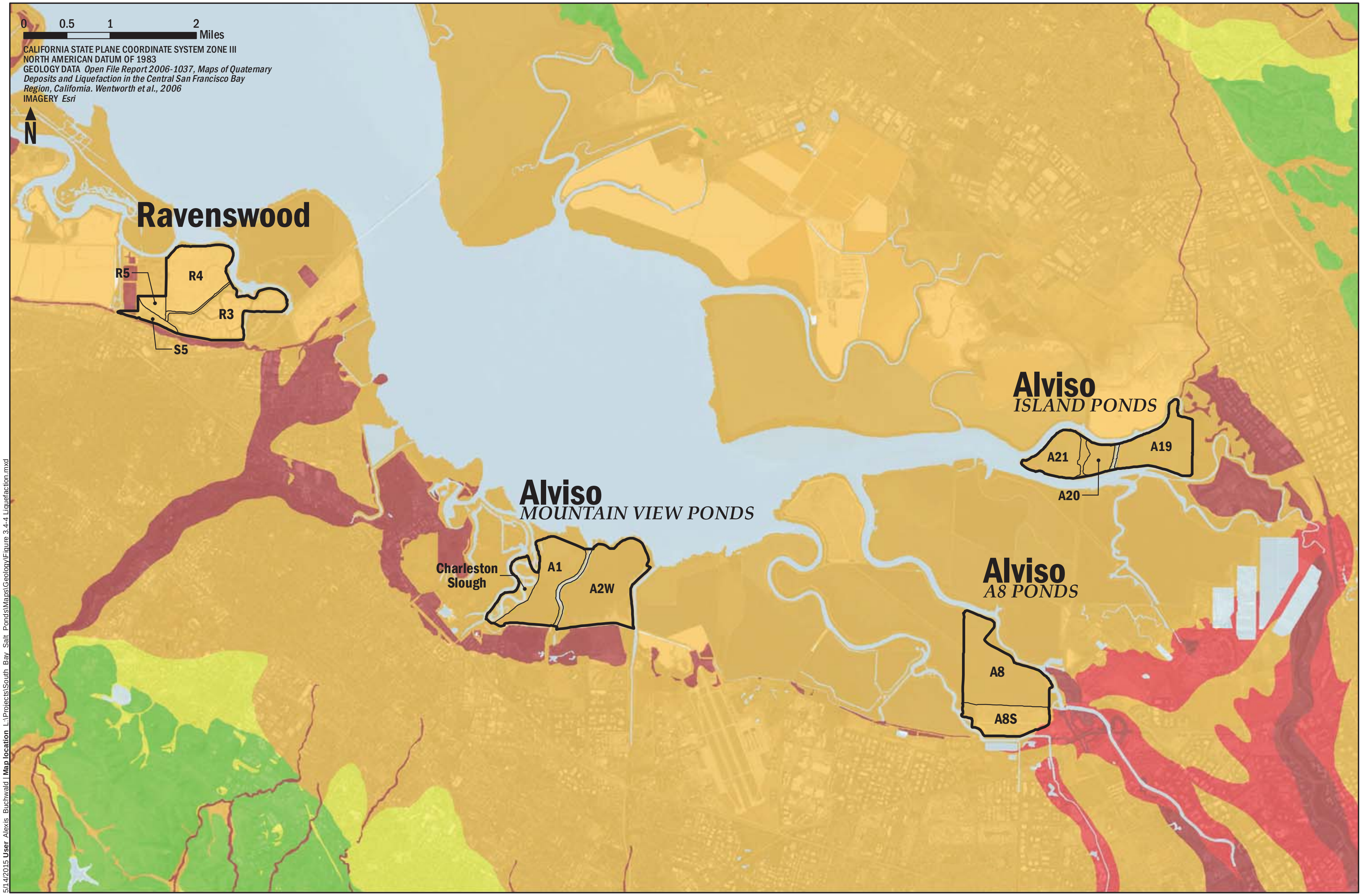
Landsliding is a general term used to describe the gravity-driven downslope movement of weathered earth materials. Landsliding is frequently used to describe rapid forms of flow, slide, or fall, where a mass of rock or weathered debris moves downhill along discrete shear surfaces. Water generally plays an important role in landsliding by oversteepening slopes through surface erosion, by generating seepage pressures through groundwater flow, and by adding weight to a soil mass when it is saturated. Other factors that influence landsliding are: (1) strength of the rock/soil material; (2) degree/depth of weathering; (3) slope angle; (4) the orientation and density of rock structures, such as bedding, joint, and fault planes; and (5) grading activities. Inertial forces from earthquake ground shaking can also reduce the stability of a slope and cause sliding or falling of soil or rock. Landslides may also be triggered by earthquakes and ground shaking.

Subsidence

Within the Phase 2 project area, Bay mud is a very soft, highly compressible material that can cause settlement and ground subsidence. The potential for settlement is correlated to the thickness of the material that underlies a given location. Therefore, a new earthen or structural load constructed in an area that contains a significant thickness of Bay mud can cause consolidation of Bay mud, which would cause ground settlement that would result in lower ground surface elevations.

Phase 2 Project Setting

Local geologic, soils, and hazards conditions in the Phase 2 project area are influenced by the geologic concepts and conditions discussed above. The entire Phase 2 project area is underlain by Holocene Bay mud. The Holocene Bay mud is relatively impermeable to both infiltration and groundwater flow. The Bay muds are generally underlain by (and in some cases overlain by) alluvial deposits.



5/14/2015 User Alexis Buchwald | Map location L:\Projects\South Bay Salt Ponds\Maps\Geology\Figure 3.4-4 Liquefaction.mxd

Phase 2 Project Area

Liquefaction Susceptibility
- Very High
- High
- Moderate
- Low
- Very Low
- Water

URS
South Bay Salt Pond Restoration Project

Figure 3.4-4
Liquefaction

Alviso-Island Ponds

Soils in the Alviso-Island pond cluster (Alviso-Island Ponds or Island Ponds) are labeled on maps as tidal marsh or salt concentration ponds (depending on the age of the map). Soils in the Island Ponds are labeled Reyes Clay and Reyes clay, ponded.

The Island Ponds are underlain by the youngest Holocene Bay mud (Atwater et al. 1977; Helley et al. 1979). Figure 3.4-2 shows the thickness of Bay mud in the Phase 2 area. According to that figure, the thickness of Holocene Bay mud within the Island Ponds is approximately 10 to 15 feet. The thickness of Bay mud is strongly correlated to subsidence.

Some Holocene levee fill and alluvium overlie parts of the Alviso-Island pond cluster. The extent of the Bay muds ends close to the outboard edge of the Island Ponds (Woodward-Lundgren & Associates 1971) (see Figure 3.4-2).

Several faults with potential for surface rupture occur in close proximity to the Island Ponds. Pond A19 is located approximately 2.1 miles southeast of the Hayward Fault. Pond A21 is located approximately 14 miles east of the San Andreas Fault. Other faults in the vicinity of the Island Ponds include the Silver Creek Fault, Palo Alto Fault, and Stanford Fault. All of these faults are concealed, potentially active Quaternary faults that have evidence of displacement sometime during the past 1.8 million years. Pond A19 is located approximately 6 miles east of the San Jose Fault, 8 miles east of the Palo Alto Fault, and 10 miles east of the Stanford Fault. The Silver Creek Fault traverses the western portion of Pond A21 in a north/south-trending direction.

The Island Ponds have a moderate susceptibility for liquefaction. The Island Ponds and their surroundings have gentle surface gradients; therefore, the potential for landslide is limited.

Alviso-Mountain View Ponds

Soils in the Alviso-Mountain View pond cluster (Alviso-Mountain View Ponds or Mountain View Ponds) are labeled as tidal marsh or salt concentration ponds (depending on the age of the map). Soils in this pond cluster are categorized as Novato silty clay loam, with portions categorized as Novato clay.

The Mountain View Ponds are underlain by the youngest Holocene Bay mud (Atwater et al. 1977; Helley et al. 1979). Figure 3.4-2 shows Bay mud thickness in the Phase 2 area. According to that figure, the thickness of Holocene Bay mud within the Mountain View pond cluster varies from 10 to approximately 25 feet. The thickness of Bay mud that underlies a given location is strongly correlated to the potential for subsidence.

Some Holocene levee fill and alluvium overlie parts of the Mountain View pond cluster (Woodward-Lundgren & Associates 1971).

Several faults with potential for surface rupture occur in close proximity to the Mountain View Ponds. Pond A1, Pond A2W, and Charleston Slough are located approximately 8.4 miles west of the Hayward Fault. The Mountain View pond cluster is also roughly 8 miles east of the San Andreas Fault. The San Jose Fault traverses the southwest portion of Pond A2W and continues northwest through Pond A1 and Charleston Slough toward the Ravenswood Complex.

The Mountain View pond cluster is also 1 mile east of the Palo Alto Fault, and 3 miles east of the Stanford Fault. The Silver Creek Fault is 5 miles east of Pond A2W. The San Jose, Palo Alto, Stanford and Silver Creek Faults are concealed, potentially active Quaternary faults that have evidence of displacement sometime during the past 1.8 million years.

The Mountain View pond cluster has a moderate liquefaction susceptibility. The pond cluster has a gentle surface gradient, and potential for landslide is therefore limited.

Alviso-A8 Ponds

Soils in the Alviso-A8 pond cluster (Alviso-A8 Ponds or A8 Ponds) are generally labeled on maps as tidal marsh or salt concentration ponds (depending on the age of the map). Soils in this pond cluster are categorized as Novato silty clay loam.

The A8 Ponds are underlain by the youngest Holocene Bay mud (Atwater et al. 1977; Helley et al. 1979). Figure 3.4-2 shows Bay mud in the Phase 2 area. According to that figure, the thickness of Holocene Bay mud within the A8 Ponds varies from 10 to approximately 25 feet. The thickness of Bay mud that underlies a given location is strongly correlated to the potential for subsidence.

Some Holocene levee fill and alluvium overlie parts of the A8 Ponds (Woodward-Lundgren & Associates 1971) (see Figure 3.4-2).

Several faults with potential for surface rupture occur in close proximity to the Alviso-A8 pond cluster. Ponds A8 and A8S are approximately 5 miles west of the Hayward Fault and 12 miles east of the San Andreas Fault.

Alviso-A8 pond cluster is approximately 9 miles east of the Stanford Fault, 7 miles east of the Palo Alto Fault, and 1.5 miles west of the Silver Creek Fault. All of these faults are considered concealed and potentially active Quaternary faults. Unlike the other Phase 2 pond clusters, no faults underlie either Pond A8 or A8S.

The A8 Ponds have a moderate liquefaction susceptibility. The A8 Ponds have a gentle surface gradient, and the potential for landslide is therefore limited.

Ravenswood Ponds

Soils in the Ravenswood pond cluster (Ravenswood Ponds) are primarily categorized as Novato-Reyes and Reclaimed Urban land-Orthents. Novato-Reyes soils are poorly drained soils located on tidal flats. Reclaimed Urban land-Orthents soils are found on urban land and reclaimed tidal flats.

The Ravenswood Ponds are underlain by the youngest Holocene Bay mud (Atwater et al. 1977; Helley et al. 1979). Figure 3.4-2 shows Bay mud thickness in the study area, the thickness of which is strongly correlated to the potential for subsidence. According to this figure, the thickness of Bay mud below the Ravenswood pond cluster varies from 20 to 60 feet. This relatively variable package of Bay mud thickness is attributed to the close proximity of the pond complex to the long axis of the Bay and the main paleo-drainage.

The San Andreas Fault is approximately 6.5 miles west of the Ravenswood pond cluster, while the Hayward Fault is 10 miles east. Both the San Andreas and Hayward Faults are active, and have the potential to cause surface rupture. Other faults in the vicinity of the Ravenswood pond cluster include the Stanford Fault and Palo Alto Fault, which are 0.5 mile west of Ponds R5 and S5, respectively. The San Jose Fault traverses a portion of both Ponds R3 and R4. The Stanford, Palo Alto, San Jose and Silver

Creek Faults are concealed Quaternary faults, meaning they have less potential for surface rupture but are still considered active faults.

The Ravenswood Ponds are adjacent to an area of very high liquefaction susceptibility. The Ravenswood pond cluster has a gentle surface gradient, and the potential for landslide is therefore limited.

Regulatory Setting

Federal

FEMA regulations govern design and construction of flood control levees that could be affected by geology, soils, and seismicity in the Phase 2 area. These regulations are discussed in Section 3.2, Hydrology, Flood Management, and Infrastructure.

State

State regulations that govern geotechnical and geological aspects of Phase 2 of the SBSP Restoration Project include the Alquist-Priolo Earthquake Fault Zoning Act and Seismic Hazards Mapping Act. The California Building Code (CBC) would apply if a significant, permanent structure is constructed; however, none is proposed. The two primary regulations governing soils and geology are discussed below.

Alquist-Priolo Earthquake Fault Zone Act

The Alquist-Priolo Earthquake Fault Zones are regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. What does it mean to be located within an Earthquake Fault Zone? It means that an active fault is present within the zone, and the fault may pose a risk of surface fault rupture to existing or future structures. If property is not developed, a fault study may be required before the parcel can be subdivided or before most structures can be permitted. If a property is developed, the Alquist-Priolo Earthquake Fault Zone Act requires that all real estate transactions within an Earthquake Fault Zone be disclosed by the seller to prospective buyers.

The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. ("Earthquake Fault Zones" were called "Special Studies Zones" prior to January 1, 1994.) The maps are distributed to all affected state agencies, counties, and cities for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. Single-family wood-frame and steel-frame dwellings up to two stories that are not part of a development of four units or more are exempt. However, local agencies can be more restrictive than state law requires.

Before a project can be permitted, counties and cities must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act addresses seismic hazards such as strong ground shaking, soil liquefaction, and earthquake-related landslides. This act requires the State of California to identify and map areas that are at risk for these and other related hazards. Counties and cities are also required to regulate development in the mapped seismic hazard zones.

Permit review is the primary method of regulating local development under the Seismic Hazards Mapping Act. Counties and cities cannot issue development permits in these hazard zones until site-specific soils and/or geology investigations are carried out and measures to reduce potential damage are incorporated in the development plans.

The design of all structures (building and non-building structures) is required to comply with the Uniform Building Code (UBC)[1] and the CBC, which are the applicable building codes. Construction activities are overseen by the immediate local jurisdiction and regulated through a multi-stage permitting process. Projects within city limits typically require permit review by the city, while projects in unincorporated areas require a county permit. Grading and building permits require a site-specific geotechnical evaluation by a state-certified engineering geologist and/or geotechnical engineer. The geotechnical evaluation provides a geological basis from which to develop appropriate construction designs. A typical geotechnical evaluation usually includes an assessment of bedrock and quaternary geology, geologic structure, and soils, and a history of excavation and fill placement. The evaluation may also address the requirements of the Alquist-Priolo Act and the Seismic Hazards Mapping Act when appropriate.

3.4.2 Environmental Impacts and Mitigation Measures

Overview

This section describes environmental impacts and mitigation measures related to geology, soils, and seismicity. It includes a discussion of the criteria used to determine the significance of impacts. Potential impacts were characterized by evaluating direct, indirect, short-term (temporary), and long-term effects. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.4.2 above, and not the proposed conditions that would occur under the No Action Alternative (the National Environmental Policy Act [NEPA] terminology will be used throughout this section). This approach is consistent with the California Environmental Quality Act (CEQA), which requires that project impacts be evaluated against existing conditions. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other Refuge management documents and practices.

Significance Criteria

For the purposes of this Final EIS/R, Phase 2 would have a significant effect if it would:

- Be located on a site with geologic features that pose a substantial hazard to property and/or human life (e.g., an active fault, an active landslide); or

[1] Published by the International Conference of Building Officials, the UBC is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC, with necessary California amendments.

- Expose people or property to major geologic hazards that cannot be avoided or reduced through the use of standard engineering design and seismic safety techniques; or
- Cause substantial erosion or siltation.

The first two of these significance criteria are addressed in the impacts discussed below, which are specific applications of the relative positions of the Phase 2 activities and geologic features (e.g., faults, Bay muds). The third bulleted significance criterion above is addressed partly herein and partly in Section 3.2, Hydrology, Flood Management, and Infrastructure. The SBSP Restoration Project, Phase 2 alternatives would not cause substantial erosion or siltation of top soils, so no further discussion of that topic is necessary here. The potential erosion caused by altering existing drainage patterns in the mudflats and sloughs is discussed in Section 3.2, Hydrology, Flood Management, and Infrastructure.

As explained in Section 3.1.2, while both CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-level Evaluation Summary

The 2007 EIS/R evaluated the potential geologic, soils, and seismic hazards that could affect the three long-term restoration alternatives. At the program level, the decision was made to select Programmatic Alternative C and implement Phase 1 actions. Therefore, a summary of the impacts for Alternative C from the 2007 EIS/R is provided below.

Potential effects from settlement and subsidence (including effects on levees and subsurface utility and surface rail crossings), liquefaction, lateral spreading, and ground and levee faults from fault rupture were found to be less than significant under Alternative C. This is because new and/or improved flood control levees would be designed, constructed, and maintained to address settlement, liquefaction, lateral spreading, and ground failure from a fault rupture. These facilities would be designed to account for the location of existing underground utilities and surface rail lines.

Risk from tsunami and/or seiche were found to be less than significant because Alternative C would not include habitable structures, and warning systems would allow for evacuation of the shoreline in such an event so inundation by tsunamis would not be expected to expose people to potential injury or death. Because impacts from Alternative C were found to be less than significant, no mitigation measures specific to geology and soils conditions are carried forward for Phase 2.

Project-Level Evaluation

Phase 2 Impact 3.4-1: Potential effects from settlement due to consolidation of Bay mud.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, the Island Ponds (Ponds A19, A20, and A21) would continue to be managed through the activities described in the AMP and other Refuge management documents and practices. The existing levees at Ponds A19, A 20, and A21 were breached on their southern sides in March 2006 as part of the Initial Stewardship Plan. These levees (and the Island Ponds as a whole) are underlain by Bay mud of varying thickness. Under Alternative Island A, the existing salt pond levees would be allowed to continue to degrade, and no new structures or weight would be added that could expedite any already occurring rates of subsidence. The Union Pacific Railroad (UPRR) and associated infrastructure would continue to be maintained as needed. Therefore, implementation of Alternative Island A would not increase the risk of any of these hazards and this impact would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Actions under Alternative Island B would result in increased hydraulic and habitat connectivity in Ponds A19 and A20 (but not Pond A21), and all ponds would continue to transition into tidal marshes. There would be no acceleration of already occurring subsidence levels caused by Alternative Island B because no new material (i.e., weight) would be added to the levees. The UPRR and associated infrastructure would continue to be maintained as needed. As such, potential effects from settlement due to consolidation of Bay mud are less than significant under Alternative Island B.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Similar to Alternative Island B, Alternative Island C would not create an increased risk of flooding or other hazards because no new material (i.e., weight) is proposed that might cause existing rates of settlement to increase. The UPRR and associated infrastructure would continue to be maintained as needed. Potential effects from settlement due to consolidation of Bay mud are less than significant under Alternative Island C.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). The Alviso-Mountain View Ponds and Charleston Slough are underlain by Bay mud of varying thickness. Under Alternative Mountain View A, no new design components would be implemented as part of Phase 2, and the United States Fish and Wildlife Service (USFWS) would continue to manage the Mountain View pond cluster through the activities described in the AMP and other Refuge management documents and practices. The outboard levees at Ponds A1 and A2W are high-priority levees that are to be maintained for inland flood protection. These outboard levees would be maintained or repaired upon failure, including failure as a result of background subsidence rates.

Therefore, implementation of Alternative Mountain View A would not increase already existing rates of settlement, and the continued maintenance of outboard levees would ensure that no new risks to neighboring populated areas are created as a result of continued subsidence of the outboard levees. Potential effects from settlement due to consolidation of Bay mud are less than significant under Alternative Mountain View A.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Levees and flood control improvements proposed under Alternative Mountain View B would add additional weight to areas underlain by Bay mud, thereby potentially increasing the existing rate of settlement. However, the levees and other improvements would be designed and constructed to compensate for settlement and consolidation, which would prevent tidal overtopping and is intended to prevent flooding. Additionally, the levees would be improved and designed to withstand seismic events to the extent practicable. The long-term settlement of improved levees resulting from increased weight would be offset by required maintenance to ensure minimum elevations are achieved, and potential effects on people and property would be less than significant.

Habitat transition zones would be constructed along the south edge of Ponds A1 and A2W as part of Alternative Mountain View B. The habitat transition zones add additional fill to the ponds, thereby potentially increasing the already occurring rates of settlement. However, the intention of the habitat transition zones and any other pond bottom modification would be to raise the elevation of the deeply subsided pond bottoms, thereby working to offset settlement and consolidation. Further, construction of the habitat transition zones would not create impacts to people or property, and would act as an additional barrier preventing potential impacts from flooding. Therefore, impacts from settlement resulting from consolidation of Bay mud are less than significant under Alternative Mountain View B.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, Ponds A1, and A2W would be breached and opened to tidal action, which would begin their transition into tidal marshes. The levee separating Charleston Slough and Pond A1 would be lowered instead of improved. To compensate for this loss of flood protection, which exists under the current conditions, a new flood protection system consisting of raised and improved levees around the western and southern portions of Charleston Slough would be constructed.

These improvements would add additional fill material to areas underlain by Bay mud, thereby potentially increasing the rate of settlement. However, the levees and other improvements would be constructed to prevent tidal overtopping and prevent flooding. They would be designed and constructed to compensate for settlement and consolidation. They would also be improved and designed to withstand seismic events to the extent practicable. Therefore, the settlement of levees as a result of increased weight would be offset by required maintenance to ensure minimum elevations are achieved, thereby preventing potential effects on people and property resulting from potentially accelerated rates of subsidence. This impact would be less than significant.

Habitat transition zones would be constructed along the south edge of Ponds A1 and A2W as part of Alternative Mountain View C. The habitat transition zones would add additional fill to these ponds and could increase background rates of settlement. However, the intention of the habitat transition zones and any other pond bottom modifications would be to raise the elevation of the deeply subsided pond bottoms, thereby working to offset settlement and consolidation. Further, construction of the habitat transition zones would not create impacts to people or property, and would act as an additional barrier preventing potential impacts from flooding. Therefore, under Alternative Mountain View C, impacts from settlement resulting from consolidation of Bay mud compared to the existing conditions in this pond cluster are less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, Pond A8, and Pond A8S would continue to be managed through the activities described in the AMP and other Refuge management documents and practices. Ponds A8 and A8S were linked in the Phase 1 actions. The A8 Ponds are underlain by Bay mud of varying thickness. Under Alternative A8 A, the existing external salt pond levees would be maintained as they currently are, and no new structures or weight would be added that could expedite background subsidence levels.

Phase 2 project components associated with Alternative A8 A would not cause additional subsidence due to consolidation of Bay mud because no new material (i.e., weight) would be added to existing levees or within the Alviso-A8 pond cluster. As such, potential effects from settlement due to consolidation of Bay mud are less than significant under Alternative A8 A.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be constructed in the southwest corner and southeast corner of Pond A8S. Similar to the Action Alternatives described above at the Mountain View Ponds, the habitat transition zones would perform several functions, including adding some flood protection and buffering against sea-level rise.

Construction of these habitat transition zones would add additional weight to areas underlain by Bay mud, thereby potentially accelerating existing background rates of settlement. However, one intention of the habitat transition zones would be to raise the elevation of part of the deeply subsided pond bottoms, thereby working to offset settlement and consolidation. Further, the design of these habitat transition zones will include planning for some degree of consolidation and settlement, so that construction of the habitat transition zones would not create impacts to people or property. Finally, the settlement of habitat transition zones as a result of increased weight would be offset by required maintenance to ensure that minimum elevations are maintained and potential effects on people and property are avoided. As a result, impacts from long-term subsidence under Alternative A8 B would remain less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). The Ravenswood Ponds are underlain by Bay mud of varying thickness. Under Alternative Ravenswood A, no new design components would be implemented as part of Phase 2, and the USFWS would continue to manage the Ravenswood pond cluster through the activities described in the AMP and other Refuge management documents and practices. The outboard levees at Ponds R3 and R4 are high-priority levees that are to be maintained for inland flood protection. These outboard levees would be maintained or repaired upon failure, including as a result of background subsidence rates.

Therefore, implementation of Ravenswood A would not increase already existing rates of settlement. Furthermore, the continued maintenance of outboard levees would ensure that no new risks to neighboring populated areas are created as a result of continued subsidence of the outboard levees. Potential effects from settlement due to consolidation of Bay mud are less than significant under Alternative Ravenswood A.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Levee improvements, construction of water control structures, habitat transition zones, and adding recreational facilities under Alternative Ravenswood B would impose new loads on the underlying Bay mud, thereby potentially accelerating existing background rates of settlement. However, the intent of levee improvements and maintenance along the All-American Canal (AAC), combined with regular maintenance of the existing outboard levees on the boundary of Pond R3, would prevent tidal overtopping and preclude potential flooding caused by long-term sea-level rise. The AAC and related improvements would be designed and constructed to compensate for settlement and consolidation.

Construction of the habitat transition zone along the western edge of Pond R4 would prevent scouring of lands associated Bedwell Bayfront Park, thereby protecting higher water levels from exposing or damaging the landfill cap. The potential accelerated settlement and consolidation caused by the addition of material along the AAC, regular maintenance of the outboard levee at Pond R3, and the addition of the habitat transition zone at the eastern edge of Pond R4 would be offset by required maintenance to ensure minimum elevations to protect against flooding are retained. Further, construction of the habitat transition zones would not create impacts to people or structures, as no public access will be provided in these areas. They would also act as an additional barrier preventing potential impacts from flooding. Therefore, the future conditions under Alternative Ravenswood B would not represent a net change from the existing levels of subsidence, and potential effects on people and property from settlement of Bay mud underlying these components over time would remain less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would be similar to Alternative Ravenswood B with the following exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond that is maintained at mudflat elevation for shore birds; a second water control structure would be installed on Pond R3 to allow for improvement to the habitat for the western snowy plover; and an additional habitat transition zone would be constructed.

The addition of material in the bottoms of Ponds R5 and S5 could potentially accelerate rates of settlement of the underlying Bay mud. This activity would not result in increased exposure of people to changes in the settlement of Bay mud because the activity would not alter the flood protection provided by the ponds.

As with Alternative Ravenswood B, the potential accelerated rates of settlement caused by the addition of material along the AAC, regular maintenance of the outward levee on Pond R3, and the addition of the habitat transition zone at the eastern edge of Pond R4 and along the AAC would be offset by required maintenance to ensure minimum elevations are retained to protect against flooding. Further, construction of the habitat transition zones would not create impacts to people or property, and would act as an additional barrier preventing potential impacts from flooding. Therefore the future conditions under Alternative Ravenswood C would not represent a net change from the existing levels of subsidence, and potential effects on people and property from settlement of these facilities over time would remain less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, potential accelerated rates of settlement caused by the addition of material along the AAC, the Redwood City stormwater interconnection components, regular maintenance of the outboard levee at Pond R3, and the addition of the habitat transition zone at the eastern edge of Pond R4 and along the AAC would be offset by required maintenance to ensure minimum elevations are retained to protect against flooding. Further, construction of the habitat transition zones would not create impacts to people or property, and would act as an additional barrier preventing potential impacts from flooding when compared to existing conditions at this pond cluster. Therefore the future conditions under Alternative Ravenswood D would not represent a net change from the existing levels of subsidence, and potential effects on people and property from settlement of these facilities over time would remain less than significant under Alternative Ravenswood D.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.4-2: Potential effects from liquefaction of soils and lateral spreading.

Alviso-Island Ponds

Alternative Island A (No Action). Based on existing data, the Island Ponds are within an area of moderate liquefaction susceptibility. The Island Ponds are geographically isolated from any urbanized and built-out areas by other waterbodies, other salt ponds, and a landfill. Under Alternative Island A, no new habitable structures would be constructed within the Island Ponds. Additionally, under this alternative, no new improvements or maintenance to existing levees would occur, except those that protect the existing UPRR rail line between Ponds A21 and A20. This alternative would allow the existing breached levees to continue to be scoured from hydraulic action and to naturally degrade over time.

Liquefaction could cause existing levees within the pond cluster to be damaged during an earthquake. Under this scenario, existing levee slopes could be partially damaged/breached or completely fail, allowing them to then be overtopped by tidal action. If this occurred, the Island Ponds would be exposed to frequent tidal inundation. In this scenario, only the levee containing the existing UPRR railroad tracks would be repaired, and all others would be allowed to remain in their damaged state, according to the AMP. Therefore, the existing UPRR line would remain protected.

If the outboard levees surrounding the Island Ponds fail, they would not be replaced; however, this would not create any new impacts from liquefaction. Therefore, impacts from Alternative Island A as a result of liquefaction or lateral spreading would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B proposes activities that would continue the transition of these ponds to tidal marsh and enhances the complexity and connectivity of the habitat. Liquefaction could cause existing levees within the Island Pond cluster to be damaged during an earthquake. Under this scenario, existing levee slopes could be partially damaged/breached or completely fail, allowing them to then be overtopped by tidal action. If this occurred, the Island Ponds would be exposed to frequent tidal inundation. In this scenario, as with Alternative Island A, only the levee containing the existing UPRR railroad tracks would be repaired; all others would be allowed to remain in their damaged state, according to the AMP. Therefore, the existing UPRR line would remain protected. The current risks of damage to the UPRR tracks would not be increased under Alternative Island B. Therefore, impacts from Alternative Island B as a result of liquefaction or lateral spreading would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C proposes activities that would continue the transition of these ponds to tidal marsh and enhances the complexity and connectivity of the habitat. Impacts resulting from lateral spreading or liquefaction under Alternative Island C would be the same as those described under Alternative Island B. The current risks of damage to the UPRR tracks would not be increased under

Alternative Island C. Therefore impacts from Alternative Island C as a result of liquefaction or lateral spreading would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Based on existing data, the Mountain View Ponds are within an area of moderate liquefaction susceptibility. Most of the pond cluster's southern boundary is adjacent to a closed landfill that is in an area of high to very high liquefaction susceptibility. Liquefaction at the Mountain View Ponds could cause failure and deformation of existing levee or landfill slopes, or levees could also be breached. Liquefaction could cause portions of levees to settle below minimum flood elevations, allowing them to be overtopped by tidal action.

Under Alternative Mountain View A, Ponds A1 and A2W would continue to be managed through the activities described in the AMP and other Refuge management documents and practices. Charleston Slough would continue to be managed by the City of Mountain View. The outboard levees at Ponds A1 and A2W are high-priority levees that are to be maintained for inland flood protection. These outboard levees would be maintained and repaired upon failure. Therefore, impacts to the existing environmental conditions as a result of liquefaction or lateral spreading would be less than significant under Alternative Mountain View A.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, the northern perimeter levee and the northern portion of the western perimeter levee at Pond A1, the eastern levee of Pond A1, and the western levee of Pond A2W would not be maintained. Additionally, the replacement or raised and improved levee between Charleston Slough and Pond A1 would be designed and constructed to resist liquefaction and lateral spreading to the extent practicable. The raised levee and other flood protection improvements at the southwest corner of Pond A1 would be similarly designed and constructed to resist lateral spreading or impacts from liquefaction, to the extent practicable. While liquefaction and lateral spreading could still occur under Alternative Mountain View B, any failures of upland flood control levees caused by liquefaction or lateral spreading would be repaired. Armored breaches and viewing platforms would also be designed to account for liquefaction and lateral spreading. The improved levees and other flood control infrastructure would be repaired should it fail as a result of liquefaction, which is similar to what would occur under the management strategy of the AMP and other Refuge management documents and practices. Therefore, Alternative Mountain View B would prevent unnecessary exposure of people and property to flood hazards resulting from liquefaction or lateral spreading. As such, impacts resulting from the selection of Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Impacts resulting from lateral spreading or liquefaction under Mountain View C would be much the same as those described under Mountain View B. The differences occur in the locations where levees and flood control infrastructure would be replaced or raised and improved. Compared to Alternative Mountain View B, under Alternative Mountain View C, the western levee of Charleston Slough (instead of the western levee of Pond A1), and the ground to be raised to tie into the high ground of the landfill under Shoreline Park would extend further around the southern end of Charleston Slough instead of stopping at the corner of Pond A1. Those improvements would also be both higher and wider to address the City of Mountain View's plans for future sea-level rise, so there would be more material placed here than elsewhere. However, equally improved design and engineering standards would be used to make these structures resistant to liquefaction and lateral spreading. Thus, the impacts from Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Based on existing data, the A8 Ponds are within an area of moderate liquefaction susceptibility. Under Alternative A8 A, the pond cluster would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices.

Liquefaction may cause portions of levees to settle below minimum elevations, allowing them to be overtopped. In areas where liquefaction causes failure and deformation of levee slopes, levees may be breached. Corresponding ponds and adjacent areas may be flooded as a result, but these conditions would exist with or without the project. Alternative A8 A would not create a new opportunity to expose people to damage resulting from liquefaction or lateral spreading. As such, impacts resulting from the selection of Alternative A8 A would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under this alternative, habitat transition zones would be constructed in Pond A8S's southwest and southeast corners. These habitat transition zones would be designed and maintained to resist liquefaction and lateral failure. While these habitat transition zones could still be affected by liquefaction, liquefaction of the soils under these habitat transition zones would not create a new hazard to people or property from flooding as a result of liquefaction and lateral spreading when compared to existing conditions in this pond cluster. Therefore, impacts resulting from lateral spreading or liquefaction under Alternative A8 B would be would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Based on existing data, the Ravenswood Ponds are within an area of moderate liquefaction susceptibility. Liquefaction may cause portions of levees to settle below minimum elevations, allowing them to be overtopped. Corresponding ponds and adjacent areas may be flooded as a result, which could impact populated areas. Due to this susceptibility, liquefaction could cause portions of levees to settle below minimum flood elevations, allowing them to be overtopped by tidal action. This could be an issue for nearby populated areas if the outboard levees at Ponds R3 and R4 became liquefied or laterally spread.

The outboard levees at Ponds R3 and R4 are high-priority levees that are to be maintained for inland flood protection and that are a component of the United States Army Corps of Engineers 1995 operations and maintenance permit. These outboard levees would be maintained or repaired upon failure. Furthermore, the nature of maintenance and repair that would take place under Alternative Ravenswood A is such that it would not cause habitable structures to be constructed within the Phase 2 site, nor would it create a new opportunity to expose people to damage resulting from liquefaction or lateral spreading. Therefore, Alternative Ravenswood A would not create a new opportunity to expose people to damage resulting from liquefaction or lateral spreading. As such, impacts resulting from the selection of Alternative Ravenswood A would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Impacts resulting from lateral spreading or liquefaction under Alternative Ravenswood B may cause portions of the levees to settle below minimum elevations, allowing them to be overtopped. Corresponding ponds and adjacent areas may be flooded as a result, which could impact populated areas. Under Alternative Ravenswood B, the existing outboard levee at Pond R3 would be maintained and repaired. Under Alternative Ravenswood B, a raised and improved levee between Ponds R3 and R4 along the AAC, tying in to high ground at Bedwell Bayfront Park at the western end, is proposed. That improved levee would be designed and constructed so as to prevent impacts from liquefaction and lateral spreading. While liquefaction and lateral spreading could still occur under Alternative Ravenswood B, failures of levees caused by liquefaction or lateral spreading would be repaired at the outboard levee of Pond R3, and harm from such failure would be prevented or minimized through the construction of a new raised levee along the AAC.

The installation of water control structures for enhanced managed ponds in Pond R3 (for western snowy plover) and Ponds R5 and S5 (for dabbling ducks and small shorebirds) would not substantially change the risk or the severity of lateral spreading or liquefaction. The habitat transition zone and the minimal additional material for a viewing platform would not substantially change the risk or the severity of lateral spreading or liquefaction.

Based on the above, Alternative Ravenswood B would prevent unnecessary exposure of people and property to flood hazards resulting from liquefaction or lateral spreading. As such, impacts resulting from the selection of Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would be similar to Alternative Ravenswood B with several exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond that is maintained at mudflat elevation for shore birds; a second water control structure would be installed on Pond R3 to allow for additional improvement to the habitat for the western snowy plover; an additional habitat transition zone would be constructed; and additional recreational and public access components would be constructed. None of the specific construction actions or attributes associated with Alternative Ravenswood C would change the potential for liquefaction or lateral spreading when compared to the existing conditions at this pond cluster. Therefore, impacts resulting from lateral spreading or liquefaction under Alternative Ravenswood C would be the same as those described under Alternative Ravenswood B and would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would be similar to Alternative Ravenswood B with a few exceptions. Alternative Ravenswood D would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create two habitat transition zones in Pond R4, establish enhanced managed ponds in Ponds R5 and S5 to improve habitat for diving and dabbling birds, increase pond connectivity, further enhance Pond R3 for western snowy plover habitat, allow stormwater outflow from Redwood City to Ponds R5 and S5, remove the levees within and between Ponds R5 and S5, and improve recreation and public access. None of the specific construction actions or attributes associated with

Alternative Ravenswood D would change the potential for liquefaction or lateral spreading when compared to the existing conditions at this pond cluster. Therefore, impacts resulting from lateral spreading or liquefaction under Alternative Ravenswood D would be the same as those described under Alternative Ravenswood B and would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.4-3: Potential for ground and levee failure from fault rupture.

Alviso-Island Ponds

Alternative Island A (No Action). The concealed quaternary Silver Creek Fault runs through the eastern end of the Alviso-Island pond cluster. Surface faults can result in ground rupture. While no surface faults traverse this pond cluster, in the event of a levee breach caused by fault rupture during an earthquake, there is a potential for flooding within the pond cluster and nearby areas. However, these areas contain no recreational components or other features that could potentially expose people to hazards as a result of the rupture. Therefore, Alternative Island A impacts associated with the potential for ground and levee failure from fault rupture would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. The concealed quaternary Silver Creek Fault runs through the eastern end of the Alviso-Island pond cluster. Surface faults can result in ground rupture. While no surface faults traverse this pond cluster, in the event of a levee breach caused by fault rupture during an earthquake, there is a potential for flooding within the pond cluster and nearby areas. However these areas contain no recreational components or other features that could potentially expose people to hazards as a result of the rupture. Additionally, this alternative would not construct any features or add infrastructure to the Island Ponds. Therefore, Alternative Island B impacts associated with the potential for ground and levee failure from fault rupture would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The concealed quaternary Silver Creek Fault runs through the eastern end of the Alviso-Island pond cluster. Surface faults can result in ground rupture. While no surface faults traverse this pond cluster, in the event of a levee breach caused by fault rupture during an earthquake, there is a potential for flooding within the pond cluster and nearby areas. However these areas contain no recreational components or other features that could potentially expose people to hazards as a result of the rupture. Additionally, this alternative would not construct any features or add infrastructure to the Island Ponds. Impacts from potential ground and levee failure from fault rupture described under Alternative Island C would be the same for Alternative Island B and would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). The concealed quaternary San Jose Fault runs through Pond A2W, Pond A1, and Charleston Slough. Surface faults can result in ground rupture. While no surface faults traverse the Alviso-Mountain View pond cluster, in the event of a levee breach caused by fault rupture during an earthquake, there is a potential for flooding within the pond cluster and nearby areas. However, under Alternative A, these areas would contain no new recreational structures or other features that could potentially expose people to hazards as a result of the rupture. As such, potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would not add new recreational facilities on the San Jose Fault trace (though a viewing platform would be added near an existing trail in both Action Alternatives at the Mountain View Ponds). The raised levee between Charleston Slough and Pond A1 would be constructed to withstand failure from fault rupture to the extent practicable. As such, potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Unlike Mountain View B, Alternative Mountain View C would add a recreational facility – the trail to be constructed on the remaining outboard levee of Charleston Slough – near the San Jose Fault trace. The trail would not directly traverse the fault trace, and this levee is a relatively recent addition and was designed and built to modern seismic standards. Also, the raised levee between Charleston Slough and the Palo Alto Flood Basin would be constructed to withstand failure from fault rupture to the extent practicable. As such, while Alternative Mountain View C would add recreational facilities near the concealed San Jose Fault trace, these facilities would not be constructed on top of the fault, so the net risk from faulting associated with this project remains the same as the existing conditions. Therefore the potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). No active or potentially active faults are mapped within the Alviso-A8 pond cluster. As such, the potential for ground and levee failure from fault rupture is less than significant under Alternative A8 A.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. No active or potentially active faults are mapped within the Alviso-A8 pond cluster. As such, the potential for ground and levee failure from fault rupture is less than significant under the Alternative A8 B.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). The concealed quaternary San Jose Fault runs through Ponds R3 and R4. In the event of a levee breach caused by surface fault rupture during an earthquake, there is a potential for flooding within the pond cluster and nearby areas. However, there are no nearby structures or recreational facilities that would be affected by this potential flooding. Therefore, impacts associated with the potential for ground and levee failure from fault rupture from Alternative Ravenswood A would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Alternative Ravenswood B would not place recreational facilities on the San Jose Fault trace. The improved levee along the AAC would be constructed to withstand failure from fault rupture to the extent practicable. Therefore, potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake under Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would not place recreational facilities on the San Jose Fault trace. The improved levee along the AAC would be constructed to withstand failure from fault rupture to the extent practicable. Therefore, potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake under Alternative Ravenswood C would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would not place recreational facilities on the San Jose Fault trace. The improved levee along the AAC would be constructed to withstand failure from fault rupture to the extent practicable. The Redwood City Bayfront Canal and Atherton Channel Project facilities would also be constructed to withstand failure from fault rupture to the extent practicable. Therefore, potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant under Alternative Ravenswood D.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.4-4: Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.

Alviso-Island Ponds

Alternative Island A (No Action). The existing UPRR runs north-south between Ponds A21 and A20. Under Alternative Island A, limited operations and maintenance activities would occur within the UPRR alignment area; however, no new earthen or structural loads would be placed in this UPRR alignment. Therefore, impacts from consolidation of Bay mud on existing surface rail crossings would be less than significant. No subsurface utility crossings occur in the Alviso-Island pond cluster.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. The existing UPRR runs north-south between Ponds A21 and A20. Alternative Island B proposes activities that would speed the transition of these ponds to tidal marsh; however, no new earthen or structural loads would be placed in or near the UPRR alignment. Therefore, impacts from consolidation of Bay mud on existing surface rail crossings would be less than significant. No subsurface utility crossings occur in the Island Ponds.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the actions would be similar to those in Alternative Island B, but in more locations. Impacts from consolidation of Bay mud on existing surface rail crossings and subsurface utilities would be the same as those described under Alternative Island B, and would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action)**.** There are no known existing subsurface utility or rail crossings within the Alviso-Mountain View pond cluster. Therefore no impact to an existing utility or rail crossing would occur from consolidation of Bay mud associated with Alternative Mountain View A.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. There are no known existing subsurface utilities or rail crossings within the Alviso-Mountain View pond cluster. Therefore no impact to an existing utility or rail crossing would occur from consolidation of Bay mud associated with Alternative Mountain View B.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. Under Alternative Mountain View C, impacts from consolidation of Bay mud on existing surface rail crossings and subsurface utilities would be the same as those described under Alternative Mountain View B.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

The Santa Clara Valley Water District (SCVWD) has a water diversion outflow pipe that empties into the underwater portions of Pond A8S near its western junction with Pond A8. This is the only known subsurface utility in these ponds. The USFWS is committed to coordinating with the SCVWD through 2007 EIS/R Mitigation Measure 3.4-6.

Alternative A8 A (No Action). The current management practices at the A8 Ponds do not impede or impair the intermittent use of this water outflow system by the SCVWD. Under Alternative A8 A, these practices would not change, and there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, the placement of upland fill material to form habitat transition zones would have the potential to impede or impair the use of the existing water diversion outflow system by the SCVWD. However, the proposed location of the western habitat transition zone in Pond A8S was chosen so as to avoid this outflow system. The design and implementation of the habitat transition zone there would avoid it completely, and the impacts on its use would therefore be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no known existing subsurface utility or rail crossings within the Ravenswood pond cluster. Therefore no impact to an existing utility or rail crossing would occur from consolidation of Bay mud. There is a Cargill Company brine channel and pipeline that runs along the southernmost edge of the Pond R3-S5 axis, adjacent to the Bay Trail, but it would not be subject to consolidation-related impacts.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no known existing subsurface utility or rail crossings within the Ravenswood pond cluster. Therefore no impact to existing utility or rail crossing would occur from consolidation of Bay mud associated with Alternative Ravenswood B. There is a Cargill Company brine channel and pipeline that runs along the southernmost edge of the Pond R3-S5 axis, adjacent to the Bay Trail, but it would not be subject to consolidation-related impacts.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C, impacts from consolidation of Bay mud on existing surface rail crossings and subsurface utilities would be the same as those described under Alternative Ravenswood B.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Under Alternative Ravenswood D, the City of Redwood City's Bayfront Canal and Atherton Channel Project would cross a number of subsurface utilities and/or easements, including cable service and a Cargill pipeline. However, as part of project design and planning, the City of Redwood City would acquire the necessary construction easements to conduct the work and avoid impacts from the installation of the box culverts to connect Pond S5 with Flood Slough and the existing storm drain outfall system. That project would be designed and built in such a way as to avoid impacts from consolidation of Bay mud or other soils on the existing subsurface utilities. The impact would therefore be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.4-1. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the AMP and other Refuge management documents and practices. The geology and soils analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.4-1 Phase 2 Summary of Impacts – Geology and Soils

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.4-1: Potential effects from settlement due to consolidation of Bay mud.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-2: Potential effects from liquefaction of soils and lateral spreading.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-3: Potential for ground and levee failure from fault rupture.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-4: Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.	LTS	LTS	LTS	NI	NI	NI	NI	LTS	NI	NI	NI	LTS

Notes:
Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.5 Biological Resources

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) characterizes the existing biological resources and natural environment in the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on biological resources. The information presented is based on review of existing conditions within the area and other pertinent federal, state and local regulations, which are presented in Section 3.5.2, Regulatory Setting. Using this information as context, an analysis of the biological environmental impacts of the project is presented for each alternative in Section 3.5.3, Environmental Impacts and Mitigation Measures. Program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of the project. Therefore, this section only includes additional, project-level mitigation measures as needed.

3.5.1 Physical Setting

Methodology

Following the methodology in the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R), this section characterizes the existing biological conditions related to Phase 2 of the SBSP Restoration Project. The principal biological components of concern are the vegetation and habitats, the wildlife, and the area of habitat subject to United States Army Corps of Engineers (USACE) jurisdiction. Phase 2 of the SBSP Restoration Project focuses on four main areas (clusters): the Island Ponds (Ponds A19, A20, and A21); the Mountain View Ponds (Ponds A1 and A2W and the adjacent Charleston Slough); the A8 Ponds (Ponds A8 and A8S); and the Ravenswood Ponds (Ponds R3, R4, R5, and S5) (Figure 3.5-1). Existing conditions in the South Bay area are documented here to provide a regional context for the proposed project. Existing conditions within each of the four pond clusters is also provided. Much of the data on wildlife use of the South Bay has been collected by resource agencies such as the United States Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW), and the United States Geological Survey (USGS); non-profit organizations and research groups such as Point Blue Conservation Science (Point Blue), formerly the Point Reyes Bird Observatory Conservation Science and the San Francisco Bay Bird Observatory (SFBBO); government entities such as the City of San Jose; consultants; researchers; and private individuals.

Regional Setting

As discussed in the 2007 EIS/R, the San Francisco Bay Estuary is the largest estuary on the west coast of North America and is an extremely productive and diverse ecosystem (Trulio et al. 2004). The South San Francisco Bay (South Bay) includes some of the most important habitat remaining in the Bay Area for a number of wildlife species (Goals Project 1999). The term “South Bay” refers to the portion of San Francisco Bay (Bay) south of Coyote Point on the western shore and San Leandro Marina on the eastern shore (Goals Project 1999). This region differs in several physical and ecological aspects from the other portions of San Francisco Bay Estuary. The habitats included in the South Bay are open waters and subtidal habitats to the upper reaches of tidal action, tidal and nontidal wetlands, and former salt evaporation ponds adjacent to the Bay, and the upland areas immediately adjacent to these features (see Figure 3.5-1).

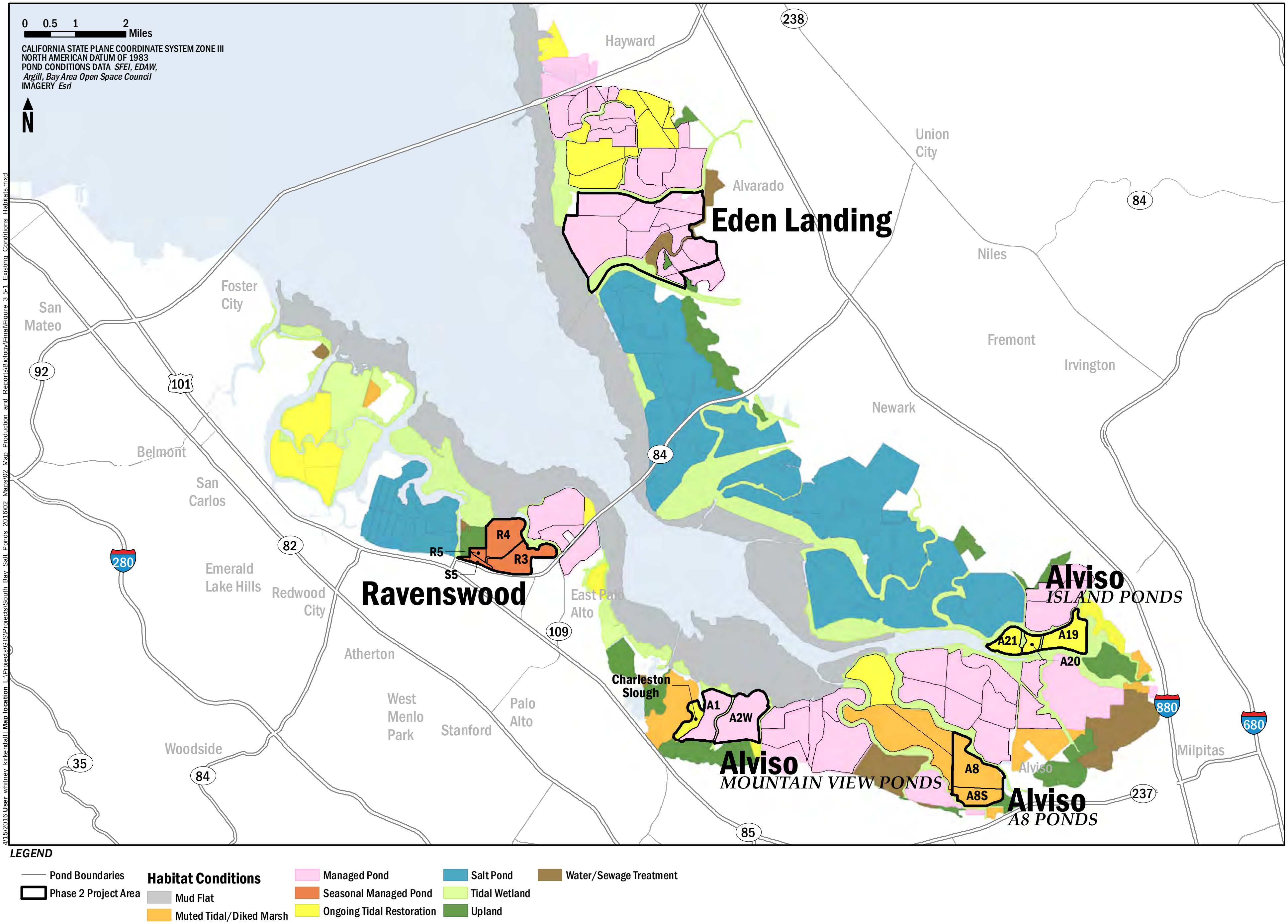
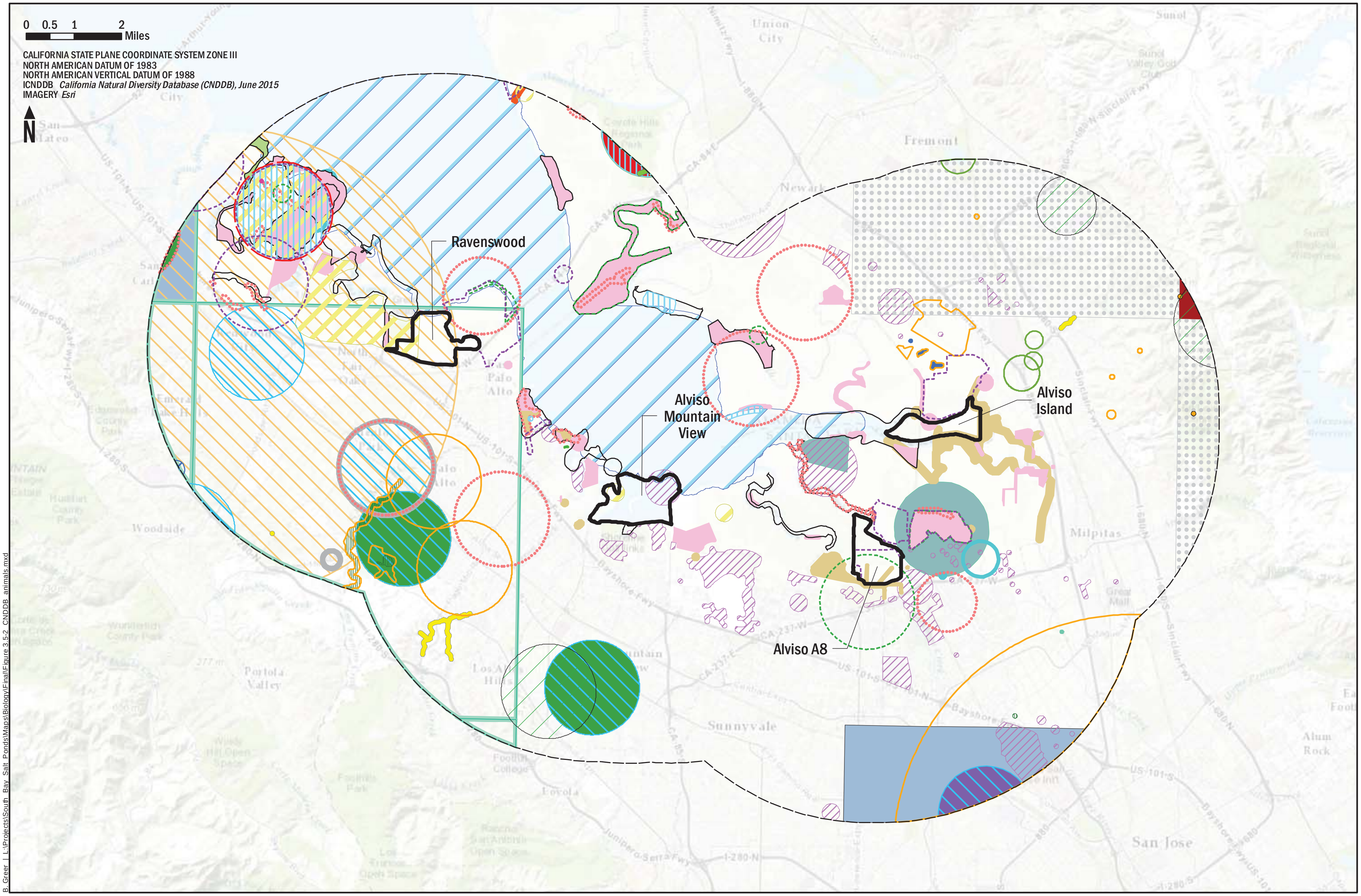


Figure 3.5-1
Existing Condition Study Area Habitats

The diversity of habitat types, particularly within the South Bay, is largely responsible for the diversity of wildlife species that occur. Although the high productivity of these habitats allows those species that are not habitat-limited to achieve substantial numbers, the tidal salt marshes and open waters that sustain aquatic plants and phytoplankton and the ponds that sustain high biomass of invertebrates are the basis of the estuary's complex and productive food web. The San Francisco Estuary supports more than 250 species of birds, 120 species of fish, 81 species of mammals, 30 species of reptiles, and 14 species of amphibians (Siegel and Bachand 2002). Equally important, the San Francisco Estuary supports populations of species that are of regional, hemispheric, or even global importance. A number of special-status wildlife species—including endemic, endangered, threatened, and rare wildlife species or subspecies—reside in the San Francisco Bay Area. Figure 3.5-2 illustrates occurrences of these special-status species with data from the California Natural Diversity Database (CNDDB). These rare San Francisco Bay area endemics include the California Ridgway's rail (*Rallus obsoletus obsoletus*; formerly California clapper rail), salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*) and salt marsh wandering shrew (*Sorex vagrans halicoetes*) in remnant tidal marsh habitat and other species such as California least tern (*Sterna antillarum browni*), western snowy plover (*Charadrius nivosus* ssp. *nivosus*), and steelhead (*Oncorhynchus mykiss*; Central California Coast Distinct Population Segment).

The southern San Francisco Bay Area, including the former salt-production ponds and managed ponds, provide habitat for more than one million waterbirds each year, including large percentages of the Pacific Flyway populations of some shorebird, duck, and tern species (Page et al. 1999; Stenzel and Page 1988; Takekawa et al. 2001; Trivedi and Gross 2005). With its extensive mudflats, remnant salt marshes, and ponds, the South Bay in particular supports very high diversity and abundance of waterbirds (Harvey et al. 1992; Takekawa et al. 2000; Warnock 2004). Some species, such as the Wilson's phalarope (*Phalaropus tricolor*), red-necked phalarope (*Phalaropus lobatus*), eared grebe (*Podiceps nigricollis*), and the federally threatened western snowy plover, forage in the South Bay most abundantly in shallow salt ponds and on exposed pond bottoms or edges; western snowy plover also nest in the dry salt pannes or salt flats in some former salt ponds. In contrast, a number of bird species use other habitats extensively as well, and most shorebirds occur in ponds primarily during high tide, when their preferred intertidal foraging habitats are inundated (Warnock 2004). Use of individual ponds by foraging birds is influenced primarily by water depth and salinity, which mediate food availability. Salinity affects the availability or abundance of prey in these ponds—fish for piscivorous species occur in low-salinity ponds, while species that forage on brine flies (especially *Ephydra millbrae* and *Lipochaeta slossonae*), reticulated water boatmen (*Trichocorixa reticulata*), and brine shrimp (*Artemia franciscana*) in the higher-salinity ponds can benefit from the considerable biomass of these invertebrates in areas where water depths are suitable for foraging. At any given time, only a relatively small portion of the pond complexes provide suitable conditions (e.g., moist soil or shallow water) for foraging by shorebirds. Numerous waterbirds use the ponds and their associated islands and levees primarily for roosting, either at night or during high tide, when their preferred foraging habitats are submerged. Large mixed species flocks of shorebirds, gulls, terns, cormorants, pelicans, herons, and other birds are often seen roosting or loafing on levees, in shallow water, or on exposed mud in the ponds, and several species are known to use isolated or undisturbed pieces of upland habitat for nesting, including levees and islands.



LEGEND

Phase 2 Project Boundaries
5-mile buffer around Phase 2 Project Boundaries
CNDDB Sensitive Species Animals
Alameda song
Alameda
American badger
American peregrine
Bank
Bay checkerspot butterfly
Double-crested cormorant
Burrowing owl
California black rail
California clapper rail
California least
California red-legged
California tiger salamander
Golden
Great blue
Hoary bat
Longfin smelt
California brackishwater snail
Monarch butterfly
Northern harrier
Pallid bat
Prairie
Salt-marsh harvest
Salt-marsh wandering
Saltmarsh common yellowthroat
San Francisco garter
Santa Cruz kangaroo rat
Short-eared owl
Snowy egret
Steelhead - central California coast DPS
Swainson's
Townsend's big-eared bat
Tricolored
Vernal pool tadpole
Western pond
Western snowy plover
White-tailed

URS
South Bay Salt Pond Restoration Project

Figure 3.5-2
CNDDB Special-Status Wildlife Species

There are two commercial airports in the South Bay (San Francisco International Airport and Norman Y. Mineta San Jose International Airport), smaller private airstrips in San Carlos and Hayward, and the Moffett Federal Airfield, which is also used by the California Air National Guard. These airfields do present some potential for bird strikes by planes flying into or out of them. Such bird strikes are rare enough as to present very little potential for affecting the various populations of special-status birds. The 2007 EIS/R did not include bird strikes as a potential impact on biological resources. In fact, the potential impact of concern is more about the possibility of reductions in aviation safety from aircraft hitting birds in the air. An analysis of these impacts was conducted for the Bair Island EIS/R (USFWS 2006), which identified the greatest risks to aviation safety from bird strikes as being from larger and higher-flying waterfowl that are attracted more to open-water ponds than they are to tidal marshes. Tidal marsh tends to attract smaller and lower-flying or ground-based birds. This point was mirrored in the Federal Aviation Administration's 2007 Circular on hazardous wildlife attractants on or near airports, which found that cormorants, cranes, pelicans, and ducks presented much greater hazards to aviation than do small shorebirds (FAA 2007).

With the exception of the Mountain View Ponds, the ponds included in the Phase 2 alternatives are all further away than the recommended 10,000-foot distance a project should be from an airport. The southeast corner of the Mountain View Ponds is approximately 2,500 feet from the end of the Moffett Federal Airfield runway. However, since, under Phase 2 actions, the Mountain View Ponds would be converted from open water ponds to tidal marshes, the Phase 2 actions are not expected to increase the risk or hazard associated with bird strikes. For this reason, bird strikes are not exhaustively assessed in this Final EIS/R.

The details of the habitats in and adjacent to the former salt ponds proposed for restoration under Phase 2 and the species that utilize these habitats are discussed in greater detail in the following section.

SBSP Phase 2 Project Setting

The Phase 2 activities assessed in this document are in the Alviso and Ravenswood pond complexes. The following subsections present a summary of the major habitat categories that were mapped in 2004 in the immediate vicinity of each of the three SBSP Restoration Project pond complexes. In addition, a wetland delineation (URS 2014) of the Phase 2 pond clusters was conducted in 2013; this delineation identified tidal salt marsh, freshwater marsh, upland/levees, mudflats, water-filled former salt ponds, and unvegetated non-mudflats (seasonally wet salt pannes) as the primary habitat types of the Alviso and Ravenswood pond complexes. The preliminary wetland delineation report prepared for submission to the USACE is included as Appendix E; map figures of these delineation results are included therein.

The following discussion first generally describes the habitat types within the Alviso and Ravenswood and Phase 2 pond complexes. The subsequent section then describes more specifically which of these habitats occur within each pond cluster.

Habitats Identified within the Alviso and Ravenswood Pond Complexes

Tidal Salt Marsh

Tidal salt marsh vegetation consists of halophytic (salt-tolerant) species adapted to occasional to regular (tidal) saltwater inundation. Tidal salt marsh occurs on the outboard (San Francisco Bay) portions of salt pond levees; these are often referred to as fringing marshes.

In tidal salt marsh, cordgrass (*Spartina* sp. – OBL[1]) dominates low marsh areas. Pacific cordgrass (*Spartina foliosa*) has hybridized extensively with smooth cordgrass (*Spartina alterniflora*), a non-native species from the east and gulf coasts of North America. One or both of these species and/or their hybrids may be present at any one location.

The pickleweed and cordgrass salt marsh habitats are generally separated by elevation; cordgrass typically occurs below the Mean High Water (MHW) mark and pickleweed occurs above this mark and often extends into higher elevations. However, the hybridized cordgrass can extend into the pickleweed elevation in some marshes. Pickleweed (*Sarcocornia depressa* and *S. pacifica* – OBL) dominates middle marsh areas, and high marsh areas feature a mixture of pickleweed and other moderately halophytic species, including alkali heath (*Frankenia salina* – FACW), saltgrass (*Distichlis spicata* – FAC), saltmarsh dodder (*Cuscuta salina* – NL), small flowered iceplant (*Mesembryanthemum nodiflorum* – FAC), fleshy jaumea (*Jaumea carnosa* – OBL), spearscale (*Atriplex prostrate* – FACW), perennial pepperweed (*Lepidium latifolium* – FAC), New Zealand spinach (*Tetragonia tetragonioides* – NL), and marsh gumplant (*Grindelia stricta* var. *angustifolia* – NL). High marsh species frequently occur above the high tide line, which is indicated by wrack material (water-transported organic and synthetic detritus). The outboard areas from pond levees and lower reaches of sloughs surrounding Ponds A1, A2W, and R4 typify tidal salt marsh in the project area.

In addition to the endangered salt marsh harvest mouse and the California Ridgway's rail, the Alameda song sparrow (*Melospiza melodia pusillula*), endemic to the Central and South San Francisco Bay, nests in dense herbaceous vegetation in salt and brackish marshes. The savannah sparrow (*Passerculus sandwichensis*) nests in pickleweed and peripheral halophytes in the upper marsh and upland transitional zones. The saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*) nests in tidal and nontidal brackish and freshwater marshes and possibly also in low densities in salt marsh habitat (Shuford and Gardali 2008) in the South Bay. A wide variety of birds nest in the tidal marshes of the South Bay, including several species of ducks, Virginia rails (*Rallus limicola*), soras (*Porzana carolina*), black-necked stilts (*Himantopus mexicanus*), northern harriers (*Circus cyaneus*), and in a few locations herons and egrets (Gill 1977). Also, California black rails (*Laterallus jamaicensis coturniculus*) breed in small numbers in these marshes (Liu et al. 2005). In addition, non-breeding birds, including larger shorebirds, swallows, blackbirds, and other species, roost, occasionally in large numbers, in the tidal marsh. Tidal marshes (and mudflats) in several South Bay locations are also used as haul-out and pupping sites by harbor seals (*Phoca vitulina*).

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[1] Plant indicator status categories include (Environmental Laboratory 1987):

- OBL - Plants that almost always occur in wetlands under natural conditions (estimated probability >99%), but which rarely occur in non-wetlands
- FACW - Plants that occur usually (estimated probability >67% to 99%) in wetlands, but also occur in non-wetlands
- FAC - Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands
- FACU - Plants that occur sometimes (estimated probability 1% to <33%) in wetlands, but occur more often in non-wetlands
- UPL - Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always in non-wetlands
- NL – Not listed or evaluated for this region

Brackish Marsh

Brackish marsh occurs along the intertidal reaches of the creeks and sloughs that drain to the Bay, where salinities are lower due to freshwater input. Brackish marsh is found where intermediate interstitial soil salinities occur along creeks and sloughs; where freshwater channels experience periodic tidal inundation, and where groundwater emerges into tidal marshlands. Vegetative diversity and richness increase with greater freshwater influence. Where sediment deposits form terraced floodplains along low-flow channels, short bulrushes such as seacoast bulrush (*Bolboschoenus robustus* – OBL) and saltmarsh bulrush (*Bolboschoenus maritimus* ssp. *paludosus* – OBL) dominate the brackish habitat. These terraced areas may also support dense populations of the invasive perennial pepperweed, which can quickly develop into monotypic stands with increasing levels of disturbance. Other moderately halophytic plants such as brass buttons (*Cotula coronopifolia* – OBL) and taller bulrushes, including California bulrush (*Schoenoplectus californicus* – OBL) and hard stemmed tule (*Schoenoplectus acutus* var. *occidentalis* – OBL), occur in areas of lower soil salinity (e.g., toward the upland edges of brackish marsh). Tidal salt marsh species, including pickleweed, alkali heath, saltgrass, and spearscale, may also colonize brackish habitat. The periphery of Pond A19 and the adjacent Mud Slough are exemplary of brackish marsh in the project area.

Brackish marshes support many of the wildlife species that use salt marsh and freshwater marsh habitats. Species composition and the relative abundance of different species may vary spatially within brackish marshes depending on water salinity, vegetation type, and habitat structure. Variability in salinity within brackish marshes is likely most important for aquatic species, which are directly subject to variation in salinity. Brackish marshes are particularly important for anadromous fish (migrating from saline to fresh water to spawn), catadromous fish (migrating from fresh to saline water to spawn), and invertebrates such as shrimp, which use brackish marshes while physiologically acclimating to changing salinity on their migrations between saline and freshwater habitats.

The often taller and more dense vegetation in brackish marshes supports large densities of breeding song sparrows, saltmarsh common yellowthroats, and marsh wrens (*Cistothorus palustris*) and large numbers of Virginia rails and soras during migration and winter.

Freshwater Marsh

Freshwater marsh vegetation in and around the project area exists along the upper reaches of sloughs and creeks and primarily consists of emergent vegetation adapted to freshwater wetland conditions. Though some freshwater marshes may experience tidal influence and periodic saltwater inundation, soil salinity remains relatively low due to freshwater flowing through these areas on a regular basis. The upper reach of Ravenswood Slough (along the eastern edge of Pond R3) demonstrates the vegetation transition that occurs as freshwater influence increases. Dense stands of California bulrush and hard-stemmed tule interspersed with perennial pepperweed (*Lepidium latifolium*) or curly dock (*Rumex crispus* – FAC) compose the majority of emergent vegetation in freshwater marsh habitat. Areas less frequently exposed to freshwater flow but still exposed to occasional saltwater inundation may also host halophytic species such as marsh gumplant and pickleweed. The Guadalupe River side of Pond A8 is a location where freshwater species colonize the entire floodplain terrace.

Relatively limited areas of freshwater marsh occur in the South Bay, and the wildlife communities of these marshes (versus those of brackish and salt marshes) in the South Bay have been little studied. Where freshwater occurs along the inland margins of the project area, the Pacific treefrog (*Pseudacris* *regilla*), bullfrog (*Rana catesbeiana*), and western toad (*Bufo boreas*) are present. California tiger salamanders (*Ambystoma californiense*) (a species listed as Threatened under the Federal and California Endangered Species Acts) occur in vernal pool habitats in the Warm Springs Unit area, primarily on lands of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), adjacent to the SBSP Restoration Project area and the Newark salt ponds managed by Cargill Inc. (Cargill).

Most wetland-associated birds respond more to food availability and habitat structure than to salinity and therefore may occur in abundance in freshwater, brackish, or salt marsh habitats with suitable habitat structure. Some birds that are typically associated with fresh (versus more saline) marshes during the breeding season, such as bitterns, Virginia rails, and soras, breed sparingly in the South Bay, likely due to the limited extent of freshwater marshes. In contrast, red-winged blackbirds (*Agelaius phoeniceus*), American coots (*Fulica americana*), common moorhens (*Gallinula chloropus*), pied-billed grebes (*Podilymbus podiceps*), song sparrows, saltmarsh common yellowthroats, and marsh wrens breed commonly in freshwater marsh habitats in the South Bay. A variety of mammals occur in these freshwater habitats as well, although with the exception of the muskrat (*Ondatra zibethica*), none are associated primarily with this habitat type. Rather, mammals associated more with adjacent upland habitats use freshwater marsh for cover or foraging habitat.

Upland/Levees

The primary upland habitat existing in the Alviso-Island, Alviso-Mountain View, Alviso-A8, and Ravenswood pond clusters exists along the tops of levees and along the landward sides of the project area. Levees were constructed from native tidal salt marsh soils (silty clay) in the immediate vicinity and may occasionally be reinforced with concrete debris. Due to the high salinity of these soils and their inherent disturbed nature, many levees feature areas of bare soil or are otherwise populated by non-native halophytic species, including small flowered iceplant, New Zealand spinach, sea fig (*Carpobrotus chilensis* – FACU), Russian thistle (*Salsola soda* – FACW), and Australian saltbush (*Atriplex semibaccata* – FAC).

On levees and portions of levees where freshwater (groundwater or rain) has reduced soil salinity over time, other common ruderal species (non-native species that thrive in areas of disturbance) of forbs and grasses dominate; including black mustard (*Brassica nigra* – NL), Italian thistle (*Carduus pycnocephalus* – NL), yellow star thistle (*Centaurea solstitialis* – NL), sweet fennel (*Foeniculum vulgare* – NL), perennial pepperweed, common mallow (*Malva neglecta* – NL), bird's foot trefoil (*Lotus corniculatus* – FAC), wild oats (*Avena fatua* – NL), ripgut brome (*Bromus diandrus* – NL), crabgrass (*Digitaria sanguinalis* – FACU), Italian rye grass (*Lolium multiflorum* – NL), tall wheat grass (*Elymus ponticus* – NL), and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum* – FAC). Native shrubs may colonize more substantial levees (for instance, the coyote bush [*Baccharis pilularis* – NL] found on the Pond A19 levees).

Due to the intense disturbance of much of uplands areas adjacent to the ponds, with most areas lacking an obvious transitional zone between the aquatic bayland habitats and adjacent habitats, most of the wildlife species found in these peripheral areas are common species adapted to urban or ruderal habitats. Reptiles such as the western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), and southern alligator lizard (*Elgaria multicaranata*) and mammals such as the house mouse (*Mus musculus*), California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jack rabbit (*Lepus californicus*), cottontail

(*Sylvilagus audubonii*), brush rabbit *(S. bachmani*), valley pocket gopher (*Thomomys bottae*), and striped skunk (*Mephitis mephitis*) all occur in the upland transitional areas along the edge of the Bay.

In most areas, the bird species that occur in the peripheral upland habitats are also common, widespread species. These include permanent residents such as the Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), black phoebe (*Sayornis nigricans*), northern mockingbird (*Mimus polyglottos*), bushtit (*Psaltriparus minimus*), California towhee (*Pipilo crissalis*), red-winged blackbird (*Agelaius phoeniceus*), Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*); summer residents such as the barn swallow (*Hirundo rustica*) and cliff swallow (*Petrochelidon pyrrhonota*); transients (some of which breed at higher elevations in the Bay Area), including the Swainson's thrush (*Catharus ustulatus*); and winter residents such as the hermit thrush (*Catharus guttatus*), white-crowned sparrow (*Zonotrichia leucophrys*), golden-crowned sparrow (*Zonotrichia atricapilla*), yellow-rumped warbler (*Dendroica coronata*), and American pipit (*Anthus rubescens*).

In remote areas (e.g., levees between salt ponds far from the upland edge), South Bay levees are heavily used for nesting by birds such as double-crested cormorants (*Phalacrocorax auritus*), California gulls (*Larus californicus*), black-necked stilts, and American avocets (*Recurvirostra Americana*). Western snowy plovers have been identified nesting in relatively large numbers on some South Bay levees relatively recently, in the years since their construction. Before the development of the levees, western snowy plover primarily nested in natural dunes, many of which have been lost to development. Large numbers of shorebirds use salt pond levees for roosting, particularly when intertidal foraging habitats are inundated during high tide (Warnock 2004). Some species, including western snowy plovers, black-necked stilts, and least sandpipers (*Calidris minutilla*), also forage frequently along the margins of levees. Gulls, Forster's terns (*Sterna forsteri*), Caspian terns (*Hydroprogne caspia*), cormorants, pelicans, and other waterbirds also frequently roost on levees. The California least tern uses levees in the South Bay as post-breeding roosting sites. After breeding (primarily at Central Bay sites), adult California least terns bring their juvenile offspring to the South Bay to forage before migration. Mammals use levees for dispersal and to obtain access to foraging areas. Red foxes (*Vulpes vulpes*) and California ground squirrels often excavate dens within levees (usually near the upland edge). Levees with riprap or concrete debris provide some cover for other small mammals, including predators or nuisance species such as the Norway rat (*Rattus norvegicus*), roof rat (*Rattus rattus*), and feral cat (*Felis catus*), and peripheral halophytes along the lower edges of the levee provide high-tide refugia for species such as the salt marsh harvest mouse, California Ridgway's rail, and California black rail. These high-tide refugia may be quite important to the survival of individual rails and mice during extreme high-tide events. However, levees also provide corridors for mammalian predators to access marsh areas, which can lead to high levels of predation on marsh wildlife.

Mudflats

Naturally occurring mudflats on the outboard sides of many South Bay salt ponds begin at low tidal salt marsh areas and extend into the Bay. They form the overwhelming majority of intertidal habitat in the South Bay, with exceptions being only a narrow and deep channel near the center of the Bay and the fringing marshes and former salt ponds around the edges. Covered by shallow water during high tide, these mudflats are exposed during low tide. These intertidal habitats are inhospitable to most vascular emergent vegetation; typically supporting 0 to 10 percent cover of cordgrass or pickleweed. Narrow stretches of mudflat occur within slough and creek channels and at the mouths of major sloughs. Mudflats also exist in the basins of former salt ponds, such as Charleston Slough (adjacent to the Mountain View

Ponds), and in portions of the Alviso-Island pond cluster (Ponds A19, A20, and A21) where the levees have been breached and the pond re-exposed to Bay waters and tides. Eventually, as sediment accretes, tidal marsh habitat is expected to replace mudflat habitat within the former salt ponds.

These mudflats are a key reason for the importance of the San Francisco Bay Area to west coast shorebird populations, with an average of 67 percent of all the shorebirds on the west coast of the United States using San Francisco Bay wetlands (Page et al. 1999). Gulls and some dabbling ducks forage on the exposed mudflats as well. Because benthic invertebrates often recede deeper into the mud as the tidal elevation drops, especially large concentrations of foraging birds usually occur along the edge of the receding or rising tideline. Although the largest numbers of shorebirds forage on the broad flats along the edge of the Bay at low tide, some shorebirds, gulls, and large waders (e.g., herons and egrets) feed on the exposed flats along sloughs and channels, and the smaller channels in the brackish and salt marshes are the favored foraging areas for the state and federally endangered California Ridgway's rail.

Shorebirds, gulls, terns, American white pelicans (*Pelecanus erythrorynchos*), and ducks often use exposed mudflats as roosting or loafing areas when available, as do Pacific harbor seals (*Phoca vitulina richardsi*). When the tides rise, most of these birds return to roosting areas in salt ponds or other alternate habitats, and the seals move to open waters.

Former Salt Production Ponds

Salt ponds were previously managed for the purpose of commercial salt production. A total of 3,027.1 acres of potentially jurisdictional wetlands and other waters of the U.S. and waters of the State were identified within the footprint of the Phase 2 project alternatives. Of the features identified in the wetland delineation, 388.1 acres are freshwater marsh, tidal marsh, and seasonal wetland, and 2,639.1 acres are other waters. A total of 477.0 acres of historic water features (as defined by Section 10 of the Rivers and Harbors Act) were identified within the area surveyed for the jurisdictional wetland delineation, and 1,345.2 acres of current Section 10 waters are present within the Study Area boundaries. The margins and basins of some former salt ponds that are seasonally ponded but dry much of the year (e.g., Ponds R3 and R4 at the Ravenswood pond cluster) consist of bare ground and salt flat or salt panne (non-mudflat soils) areas. Historically, these basins were subject to regular tidal inundation, but following installation of levees and their use as salt ponds, the salinity has increased beyond the tolerance of most halophytic vegetation. Few vascular plant species surviving in this environment, such as are pickleweed, alkali heath, and the non-native small flowered iceplant (*Carpobrotus* spp.), which occur sparsely along the margins of the basins and on top of the soil terrace of the salt flats. Due to the paucity of vegetation, these ponds provide little to no cover for small mammals or reptiles and provide nesting habitat only for species that ground-nest on the levees and the occasional islands that have been created (by deposition of material dredged) within the ponds.

Many of the remaining ponds provide valuable roosting and foraging habitat for shorebirds and waterfowl. Higher-salinity ponds support high densities of brine shrimp and brine flies (especially *Ephydra millbrae*), which in turn serve as prey for eared grebes and other high-salinity specialists.

The ponds within the project area are, collectively, highly productive systems supporting large quantities of vertebrate and invertebrate biomass. However, much of the biomass produced by these ponds is unavailable to birds or fish due to water depths (for shorebirds) and salinities (for fish) that preclude these vertebrates' use of much of the invertebrates as food in the deeper, higher-salinity ponds.

Open Water and Subtidal Habitats

The open water category includes a variety of habitat types, including subtidal Bay waters, tidal sloughs and channels, and areas of standing or flowing waters within the salt ponds and tidal marshes. Deep water does not support emergent vegetation. Deep bays and channels are important for aquatic invertebrates, fishes, waterbirds, and harbor seals. The open waters of South San Francisco Bay support a high diversity of benthic and pelagic macroinvertebrates. Though most of the dominant invertebrates are non-native species, they nonetheless support native oyster populations, large fish populations representing several different trophic levels, including Pacific herring (*Clupea pallasi*), northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax caeruleus*), staghorn sculpin (*Leptocottus armatus*), several species of perch (Embiotocidae family), English sole (*Parophrys vetulus*), and California halibut (*Paralichthys californicus*). Many of these fish species in turn support harbor seals and piscivorous (fish-eating) birds such as the Forster's tern, California least tern, American white pelican, brown pelican (*Pelecanus occidentalis*), and double-crested cormorant. Waterfowl such as greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), canvasbacks (*Aythya valisineria*), and surf scoters (*Melanitta perspicillata*) dive for bivalves, crustaceans, and other invertebrates in shallower subtidal areas. Bird diversity in the open Bay waters is fairly low, as the species of birds that can exploit the subtidal areas are limited to those that can forage from the air (e.g., terns) or under water (e.g., scoters) and those that can swim. However, large densities of diving ducks (e.g., bufflehead [*Bucephala albeola*], greater scaup) occur in some areas where appropriate depths and concentrations of benthic invertebrates, particularly bivalves, provide a rich food source. Some species, such as gulls, also roost on the open waters of the Bay, especially at night.

The tidal sloughs and channels that circulate water around and in between salt ponds and marsh remnants and through the marshes provide important habitat for large numbers of benthic and pelagic invertebrates and fish. These detritus-rich channels serve as important nurseries and feeding areas for estuarine fish, including leopard sharks (*Triakis semisasciata*). California bay shrimp (*Crangon franciscorum*) spawn in the open ocean but spend much of their lives feeding in the brackish waters of South Bay sloughs (Baxter et al. 1999). Diving ducks generally avoid the smaller tidal channels but can be found in abundance, particularly during their nonbreeding season, near the mouths of the larger tidal sloughs, in open waters, and in deeper ponds. Thousands of diving ducks also roost and forage in the artificial lagoons in Foster City and Redwood Shores, north of the Ravenswood pond cluster, and in the Sunnyvale water treatment plant, southeast of the Alviso-Mountain View pond cluster, in winter. Dabbling ducks such as the gadwall (*Anas strepera*), green winged teal (*Anas crecca*), northern shoveler (*Anas clypeata*), and mallard (*Anas platyrhynchos*) reach high densities in the shallower ponds and in smaller and shallower channels, where they feed on aquatic plants (including algae, submerged aquatic vegetation, and plankton) and invertebrates. Terns often forage in the larger and mid-sized channels and ponds, and several species of herons and egrets forage in the shallows for fish. Many shorebirds feed along the exposed flats along tidal channels at low tide, as do rails and other tidal marsh birds.

SBSP Phase 2 Restoration Project Ponds

Two pond complexes, Alviso and Ravenswood, are being considered for Phase 2 restoration under this Final EIS/R.

Alviso Pond Complex

Large areas of mudflats and open water Bay habitats are found adjacent to the Alviso pond complex. Open water exists along Mountain View Slough, Stevens Creek, Alviso Slough, Artesian Slough, Guadalupe Slough, and in Coyote Creek. Large expanses of newly formed mudflat and cordgrass habitats exist downstream of the Island Ponds (Ponds A19, A20, and A21) (Callaway et al. 2009). Mudflats occur at the mouth of Guadalupe Slough and along Charleston Slough. Advancing mudflat occurs adjacent to Calaveras Point and also at the mouths of Mountain View Slough and Stevens Creek adjacent to Ponds A1 and A2W. Additional small areas of mudflats are surrounded by freshwater marsh at the upper end of the reach to the south of the Island Ponds.

Vegetation. Marsh habitat adjacent to the Alviso pond complex includes salt marsh, brackish marsh, and freshwater marsh. Salt marsh habitat occurs on the outboard levees along the extent of the Alviso pond complex. Salt marsh dominated by cordgrass is found at lower elevations bordering the mudflats and along the fringing lower elevations of Coyote Creek. Cordgrass also borders Mountain View Slough, the mouth of Stevens Creek, Guadalupe Slough and Alviso Slough, and the mouth of Mud Slough. Pickleweed-dominated salt marsh is found at higher elevations just above cordgrass-dominated marsh and extends upstream into Mountain View Slough, Stevens Creek, Coyote Creek, Guadalupe Slough, Mud Slough, and Alviso Slough. Brackish marsh covers the marsh plain in the transition from salt to brackish marsh along Coyote Creek and also dominates the outboard levees near the junction of Mud Slough and Coyote Creek. Brackish marsh replaces salt marsh moving upstream along Guadalupe Slough, Alviso Slough, Mountain View Slough, and Stevens Creek. Levees separate many of the individual ponds in the Alviso pond complex. Upland vegetation borders sections of the freshwater and brackish marshes. Unvegetated islands exist within several of the ponds.

Wildlife**.** Characteristics of ponds such as salinity, and depth may change rapidly, influencing wildlife use. In particular, changes in salinity and depth that may occur seasonally or between years may affect the abundance and species composition of invertebrates, fish, and feeding and roosting assemblages of birds in ponds. Bird surveys at ponds managed for salt production by Cargill suggest the response to physical characteristics varies between guilds. For example, small and medium shorebirds, gulls, and eared grebes showed an increase in abundance with increases in salinity while piscivorous birds, egrets and herons, and diving ducks showed marked decreases in abundance in areas of higher salinity. These different responses are likely related to the interactions between water depth, salinity, and dissolved oxygen. Some guilds, including dabbling ducks and terns showed little change in abundance with changes in salinity, potentially indicating more flexibility with regard to water quality parameters. These differences support the assumption that a range of ponds with differing physical characteristics is necessary to support a diverse and robust avian community (Scullen et al. 2015).

Monitoring conducted by USGS; SFBBO; University of California, Davis; and others indicated that the most prominent wildlife resources and patterns of wildlife distribution in the Refuge's ponds and vicinity in recent years are as follows:

- Increased use of the Island Ponds by almost all guilds of birds (dabbling ducks, diving ducks, piscivores, gulls, herons, medium shorebirds, phalaropes, and small shorebirds), with the exception of eared grebes, since the breaching of the ponds in March 2006 (SCVWD and USFWS 2010).
- California Ridgeway's rail (at least one breeding pair) were observed in Pond A21 in summer of 2014 (Jen McBroom, pers. comm., 2014).
- Fish representing 34 families have been found in the salt pond complexes. Fish abundance has also increased in the Island Ponds since the breaching in March 2006. Overall fish abundance was

consistently at least an order of magnitude higher than adjacent sites along Coyote Creek. Three-spined stickleback (*Gasterosteus aculeatus*) was the most common fish captured, with most being observed in the Alviso/Coyote Marsh complex. They are most abundant within the Island Ponds and Upper Coyote Creek Slough. Their population is consistent with a resident, annual population. Other abundant species in the Island Ponds include Pacific staghorn sculpin (*Leptocottus armatus*) and yellowfin goby (*Acanthogobius flavimanus*). Pacific herring and northern anchovy were the next-most-abundant species and were relatively common at all sites. High fish abundance at the Island Ponds is attributed to better foraging habitat in shallower water and edge habitats, a high concentration of mysid shrimp, and the refuge from predation that these former ponds now offer (Hobbs and Moyle 2009). At the Alviso/Coyote Marsh complex, Pacific staghorn sculpin, Pacific herring, and northern anchovy were the most common in 2012 (Hobbs 2012). Longfin smelt (*Spirinchus thaleichthys*) have been caught in Coyote Creek and Alviso Slough and could possibly be present in Pond A8 but have not yet been detected there. The longfin smelt a state-listed threatened species that is also a candidate for listing under the federal Endangered Species Act. It is present in the South Bay year-round. An individual chinook salmon (*Oncorhynchus tshawytscha*) smolt was found on May 18, 2012, in Coyote Creek adjacent to Pond A19 (Hobbs 2012).

- Over 365,000 individual waterbird sightings of were recorded at the Alviso pond complex in 2014. These sightings were comprised of 69 species, the highest species richness and abundance of all complexes surveyed by the SFBBO between September 2013 and August 2014 (Washburn, et al. 2015). SFBBO staff and volunteer monitors of waterbird nests have observed a wide variety of nesting birds in the project area, including double-crested cormorants, black-necked stilts, American avocets, terns, and gulls. Nests were observed on multiple substrates, including power transmission towers, in Ponds A2E, A2W, and A18; on the levees between ponds; and within the ponds themselves (Donehower et al. 2013).
    - Black skimmers (*Rynchops niger*) have been identified breeding at Ponds A1, A2W, and A8 (Ackerman and Herzog 2012; Bluso-Demers et al. 2008; Demers et al. 2010).
    - Black-necked stilts have nested at Pond A2W (Ackerman and Herzog 2012; Donehower and Tokatlian 2012).
    - Western snowy plover were most abundant at the Eden Landing and Ravenswood pond complexes, with the largest number of nests at Eden Landing in Ponds E14, E8, and E6B (Tokatlian et al. 2014, 2015; Donehower et al. 2013); in the Alviso pond complex, they have nested in ponds (when dry) A12, A13, A16, A9, and in New Chicago Marsh.
    - American avocet nests were found in Ponds A5/7, A8, A12, A2W, and R1. Forster's tern nests were found at Ponds A1, AB2, A7, A8, A16, and A2W (Donehower and Tokatlian 2012).
    - Large numbers of shorebirds forage on the intertidal mudflats ringing the South Bay south of the Dumbarton Bridge during low tide.
    - Large numbers of shorebirds roost and forage to varying degrees within the Alviso Ponds.
    - Diving ducks are found in large numbers in Ponds A2W, A5, and A1 totaling over 36,000 individuals at those ponds.

  - A number of California gull colonies are present in the Alviso pond complex; in or near the Phase 2 project area, California gull nests were found at Pond A1 and at the adjacent Palo Alto Flood Basin (Ackerman et al. 2013a). Over 13,000 California gulls and over 6,600 nests were observed by the SFBBO during walkthrough surveys of the breeding colony located in Alviso Ponds A9, A10, A11, and A14 (2015). Much of this activity was concentrated on the levees and islands in these ponds.
  - Red-tailed hawks (*Buteo jamaicensis*), northern harriers, peregrine falcons (*Falco peregrinus*), common ravens (*Corvus corax*), and double-crested cormorants nest and roost on transmission towers in several ponds and over tidal marshes, including the Alviso pond complex as well as other groups of ponds not included in Phase 2 (Ackerman et al. 2013a), and in 2006 (as well as other more recent years) a pair of peregrine falcons nested on a tower in the Alviso pond complex (Robinson et al. 2007; C. Strong, pers. comm., 2014). Red-tailed hawks and peregrine falcons were observed on the Pacific Gas and Electric Company (PG&E) towers in Pond SF2 and the Ravenswood pond complex (Robinson-Nilsen et al. 2011).

- California Ridgway's rails occur in a number of locations, although high-quality habitat is limited. The highest numbers are likely to occur within the more extensive tidal salt marshes along Coyote Creek and Mowry Slough, although this species is also present in brackish marshes in the Warm Springs area, along Guadalupe Slough and Alviso Slough, and in smaller marsh remnants along sloughs and the Bay edge.
- Mercury levels increased in both three-spined stickleback and Mississippi silverside (*Menidia beryllina*) between 2010 and 2011 in Alviso Slough (near the Alviso-A8 pond cluster). The peaks were relatively short lived, between July and August, and mercury levels returned to average by October (Ackerman et al 2013b). Mercury levels in terns and avocets saw increases between 2010 and 2011, with notably higher increases in areas of initial wetland restoration followed by subsequent decreases (Ibid).
- Steelhead occur in Stevens Creek, the Guadalupe River, and Coyote Creek, all of which are designated critical habitat for the Central California Coast Distinct Population Segment for this species.
- Chinook salmon occur in the Guadalupe River and Coyote Creek.
- Green sturgeon (*Acipenser medirostris*), listed as threatened under the federal Endangered Species Act [FESA]), is known to occupy South San Francisco Bay during every month of the year, though it does not typically enter breached ponds or adjacent sloughs or waterways.
- Salt marsh harvest mouse habitat in the Alviso pond complex is generally limited, but occurs in tidal salt marshes that fringe the existing ponds and in the diked salt marsh habitat at New Chicago Marsh. Most of the Alviso marshes are brackish marshes, areas in which salt marsh harvest mice have been recently discovered. Although their use of these brackish habitats in the South Bay is not well understood, early indications are that populations in the brackish marshes are not as dense as those in mature salt marsh dominated by pickleweed. The salt marsh that does exist typically has little to no high marsh or escape cover except along levee edges.

Phase 2 Action Areas. The characteristics of the individual ponds that were chosen for Phase 2 of the SBSP Restoration Project are discussed below.

Ponds A19, A20, and A21. Ponds A19 (265 acres), A20 (65 acres), and A21 (150 acres) are called the Island Ponds. They are bordered on the north and west by Mud Slough and on the south by Coyote Creek. As part of the Initial Stewardship Plan (ISP), the Island Ponds were breached to Coyote Creek and tidal action in March 2006. Once breached, these ponds provided intertidal foraging habitat for shorebirds and other waterbirds at low tide and tidal foraging habitat for waterfowl at high tide. As sediment has accumulated (and the gypsum layer is buried and/or deteriorates), tidal marsh vegetation is becoming established, providing breeding and foraging habitat for the California Ridgway's rail (recently noted in Pond A21) and other marsh species. Though ruderal in their vegetation species composition, upland portions of the levees may provide suitable habitat for a range of species that need high-tide refugia. The outboard margins of the pond levees (on Mud Slough and Coyote Creek) are characterized by seasonally brackish marsh.

Ponds A1 and A2W and Charleston Slough. Pond A1 (275 acres) and Pond A2W (435 acres) are bordered on the north by the Bay and on the south by Mountain View Shoreline Park. Pond A1 is bordered on the west by Charleston Slough, which has muted tidal action. Pond A2W is bordered on the east by Stevens Creek; although hydraulically connected by a siphon, the ponds are separated by Mountain View Slough. The outboard areas of the pond levees and the lower reaches of the surrounding sloughs are characterized by tidal salt marsh and the interior of these ponds are primarily open water or mudflat with little to no visible vegetation. Suitable nesting bird habitat (for California gulls, Forster's terns, American avocets, black-necked stilts, and the occasional black skimmer) exists on a few small, isolated islands found within the interior waters of Ponds A1 and A2W.

Charleston Slough itself is a 115-acre muted tidal mudflat that is separated from the Bay's full tidal flows by a levee and a large tide gate structure owned and operated by the City of Mountain View. The water intake for the city's Shoreline Park sailing lake (at the foot of the southern end of the slough) takes in 8 to 10 million gallons of water per day, which maintains a channel deeper than the rest of the slough's tidal mudflats that runs the length of the slough from the tide gate to the intake. The intertidal mudflats around the channel draw large numbers of foraging shorebirds, ducks, and other species, particularly at low tide. The southern and western levees around Charleston Slough support popular public access/recreation trails and ruderal and other vegetation.

Ponds A8 and A8S. Pond A8 (410 acres) is bordered on the west by Ponds A5 and A7, on the north and east by Alviso Slough, and on the south by Pond A8S. Pond A8S (160 acres) is bordered on the south and west by the freshwater marsh of Guadalupe Slough and industrial development to the east and is now effectively part of Pond A8. Ponds A5, A7, A8, and A8S were all linked as part of Phase 1 actions that took out portions of the interior levees that had separated them. These ponds provide forage habitat for terns, waterfowl, and shorebirds and the levees provide nesting habitat. Sediment has been accreting in these ponds since they were opened to muted tidal flows through culverts and a variable-size, reversible armored notch in 2011. The ponds provide habitat for fish and benthic invertebrates that provide food for a variety of species.

Ravenswood Pond Complex

Tidal marsh, mudflat, and open water bay habitats are found around the former salt-production ponds of the Ravenswood pond complex. Narrow tidal marsh habitat exists along the outboard edges of many ponds and more extensively in Ravenswood Slough. A large tidal marsh, Greco Island, lies north and west of the pond complex. Open water habitat exists throughout the pond complex in the historic slough channels and in seasonally flooded ponds. Mudflat habitat has formed at the mouth of Ravenswood Slough. The pond complex includes salt marsh and peripheral halophyte marsh habitats adjacent to the ponds. A large expanse of mudflat lies to the north and east of the pond complex.

Vegetation. The Ravenswood pond complex is surrounded by salt marsh that consists of cordgrass marsh along the lower elevation fringes of the marsh and pickleweed marsh in the higher elevation marsh plain. Some patches of salt marsh are dominated by other species, particularly along the southern edge of the pond complex. Peripheral halophyte vegetation borders the salt marsh in much of the transitional zone to upland areas. Upland vegetation is also found at higher elevations around the salt marsh boundary, often bordering the levees. There is one small area of freshwater marsh along the southern boundary of the Ravenswood pond complex.

Wildlife. Characteristics of ponds such as salinity and depth may change rapidly, influencing wildlife use. In particular, changes in salinity and depth that may occur seasonally or from year to year may affect the abundance and species composition of invertebrates and fish and the feeding and roosting assemblages of birds in ponds. However, based on recent monitoring conducted by USGS, SFBBO, and others, the most prominent wildlife resources and patterns of wildlife distribution in the Ravenswood pond complex and vicinity in recent years are as follows:

- Moderate numbers of western snowy plovers breed and winter in ponds throughout the Ravenswood pond complex as a whole (R1, R2, R3, R4, R5, SF2, and S5) (Donehower et al. 2013). During the 2012 surveys, the most plover nests were found in Pond R1 (Donehower et al. 2013). Phase 1 restoration actions modified Pond SF2 to provide habitat islands and improved forage for plovers, which have intermittently nested there in recent years. Of the Phase 2 Ravenswood Ponds (R3, R4, R5, and S5), plover tend to use Ponds R4 and R3 most often. In 2015, Pond S5 had four active nests; no nests had been found in that pond since 2012.

- Large numbers of shorebirds forage on mudflats north and east of the Ravenswood pond complex at low tide.

- Large numbers of waterfowl and shorebirds roost and forage to varying degrees in Ponds R1, R2, and SF2.

- Medium shorebird observations at Pond SF2 were the second highest of all ponds monitored by SFBBO in 2014/2015 with over 9,500 individuals. Over half of the medium shorebirds were observed on islands (2015).

- Over 42,000 individual waterbird sightings comprised of 50 species were recorded between September 2013 and August 2014 by the SFBBO (2015).

- California Ridgway's rails occur along Ravenswood Slough and along the northwest edge of Pond R4 immediately adjacent to Greco Island. The vegetation along the levee edges provides high-tide refugia for cover from predators during extreme high tides, but otherwise California

Ridgway's rail habitat along the edges of other ponds in the complex is very limited. Much more extensive habitat exists near large Ridgeway's rail populations on Greco Island, to the northwest, and in East Palo Alto and Palo Alto marshes, to the south.

- Salt marsh harvest mouse habitat is very limited in extent and quality (i.e., the tidal marshes are very narrow and have little to no escape cover). With the exception of limited areas on Greco Island, the extent of high marsh habitat and transition zones to higher areas (for refugia during the highest spring tides) is limited enough to constrain habitat quality for the salt marsh harvest mouse. As noted previously, these high-tide refugia are important to this species.

Phase 2 Action Areas. The characteristics of the individual ponds that were chosen for Phase 2 of the SBSP Restoration Project are discussed below.

Ponds R3 and R4. Pond R3 (270 acres) is bordered on the north and west by Pond R4, by the Ravenswood Slough on the north and east, and by State Route (SR) 84 and industrial areas on the south. Pond R4 (295 acres) is bordered on the north by the Bay, on the northwest by Greco Island (~700 acres), on the west by Bayfront Park and Pond R5, on the east by Ravenswood Slough and on the south by Pond R3. The levees of these ponds are unbreached. These ponds are seasonally wet ponds that collect rainwater during winter but dry out to become salt pannes in summer. The upland and remnant slough channels and borrow ditches within the ponds have extremely high salinity, which inhibits most plant life but the salt flats do provide nesting habitat for special-status species including the threatened western snowy plover. Vegetation growing on the pond bottom is limited to extremely salt-tolerant vegetation, notably small flowered iceplant, which is an invasive species requiring active and regular control efforts.

Ponds R5 and S5. Ponds R5 and S5 (30 acres each) are separated by a levee that runs diagonally northwest to southeast. These ponds are bordered on the north and west by Bedwell Bayfront Park, on the east by Ponds R4 and R5 and on the south by a channel separating the ponds from SR 84. These ponds are seasonally wet ponds that collect rainwater during winter but dry out to become salt pannes in summer. They contain little to no vegetation. A drainage outlet for stormwater runoff from the Bayfront Canal and Atherton Channel in portions of Redwood City, Atherton, and Menlo Park carries water into Flood Slough next to the southern exterior of Pond S5, creating freshwater to brackish marsh habitat on the water's way to the Bay.

Other Notable South Bay Wildlife Resources Outside the Project Area

The most prominent wildlife resources and patterns of wildlife distribution within the general South Bay area are as follows:

- Steelhead use estuarine habitats as rearing habitat for juveniles and move through the project area on their migrations to and from upstream spawning areas in the designated critical habitat in Stevens Creek, Coyote Creek, and Guadalupe River.
- Green sturgeon have been found throughout San Francisco Bay (the designated critical habitat for this species), though its population and its freshwater spawning tend to be concentrated in the northern portions of the Bay and the Sacramento-San Joaquin River Delta.
- Large numbers of shorebirds forage on the intertidal mudflats ringing the South Bay during low tide and roost (and, variably, forage) in ponds and other alternate habitats at high tide.

- Large numbers of waterfowl forage and roost on open bay and pond waters and other available habitats.
- The largest harbor seal haul-out site in the South Bay occurs along lower Mowry Slough. Other areas frequently used as haul-out sites are near Calaveras Point, at Dumbarton Point, on Greco and Bair Islands, and along Corkscrew Slough.
- California Ridgway's rail and salt marsh harvest mouse habitat in many areas is somewhat limited in extent and connectivity. For example, many of the tidal marshes are very narrow and have little to no escape cover or transitional habitat. Relatively large marshes occur on Dumbarton Point, between Newark and Mowry Sloughs, Faber-Laumeister Marshes along the peninsula, at the Palo Alto Baylands Park and Nature Preserve, and on Greco and Bair Islands. The highest population densities for rails continue to be in South San Francisco Bay. The largest populations occur in Arrowhead Marsh, Dumbarton Point, Mowry Slough, the Faber/Laumeister Marshes, Bair Island, and Greco Island (USFWS 2013).

Special-Status Plant Species

The special-status plant species that occur in the South Bay in the vicinity of the SBSP Restoration Project are discussed in this section. The most current and historic pertinent information was reviewed to compile a list of species considered for occurrence within the Phase 2 project area. The CNDDB was queried to determine the potential for occurrence in the area based on known populations and habitat requirements. This database represents the most current data available regarding special-status plant distribution within California. A map of the results is presented as Figure 3.5-3.

The SBSP Restoration Project pond complexes themselves are not expected to support many special-status plants: vascular plants are entirely absent from artificial, hypersaline ponds, and levees and remnant marshes provide peripheral halophytic habitat bearing little resemblance to the broad, relatively heterogeneous habitat of an intact upper marsh. However, special-status plants may once have occurred in the natural salt pannes, sandy deposits, and slough channels of the former marsh, and habitat still exists in the general area of the SBSP Restoration Project and its surroundings. The legal status and likelihood of occurrence of these species are listed in Table 3.5-1.

No Endangered Species Act-listed or -proposed plants have been documented within the boundaries of the Alviso or Ravenswood pond complexes (CNDDB 2013). However, there are a number of historical or extirpated records from nearby (Figure 3.5-3). Several records of Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*), alkali milk vetch (*Astragalus tener* var. *tener*), and Hoover's button celery (*Eryngium aristulatum* var. *hooveri*) were collected nearby in the early 1900s, but are mostly believed to be extirpated (CNDDB 2013). Numerous occurrences of five species—Congdon's tarplant (*Centromadiaa parry*i ssp. *congdonii*), prostrate navarretia (*Navarretia prostrata*), alkali milk vetch (*Astragalus tener* var. *tener*), Contra Costa goldfields (*Lasthenia conjugens*), and San Joaquin spearscale (*Atriplex joaquiniana*)—have been documented in the vicinity of the Alviso pond complex. However, these occurrences are exclusively within the Pacific Commons Preserve (which is now part of the Warm Springs Unit of the Refuge), just north of Pond A22, except for Congdon's tarplant, which was recorded adjacent to Stevens Creek in 2002 (H.T. Harvey and Associates et al. 2005) and at Sunnyvale Baylands Park south of Pond A8 (CNDDB 2013).

A California Rare Plant Rank (CRPR) 4.3 species, small spikerush, *Eleocharis parvula*, has been identified at the Island Ponds. CRPR 4.3 species are non-threatened watch list species, which are uncommon enough that their status is monitored regularly. CRPR lists are maintained by the California Native Plant Society (CNPS), CDFW, and other organizations; the CRPR was called the CNPS list until recently. The small population of small spikerush is in three separate patches on exposed mud flat at the edge of the northwest corner of Pond A19.

The goals of the SBSP restoration Project are aligned with the goals set in the USFWS Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (2013). The ultimate goal of this Recovery Plan is to recover all listed species and remove them from listing under the Endangered Species Act. The interim goal is to recover all endangered species to the point that they can be downlisted from endangered to threatened status. The goal for *Chloropyron maritimum* ssp. *maritimum* (salt marsh bird's-beak) is to support recovery strategies detailed in the Salt Marsh Bird's-beak Recovery Plan (U.S. Fish and Wildlife Service 1985a). For species covered by that plan that are not federally listed as threatened or endangered, the goal is to conserve them so as to avoid the need for protection provided by listing. To achieve these goals, the following objectives were developed: (1) secure self-sustaining wild populations of each covered species throughout their full ecological, geographical, and genetic range; (2) ameliorate or eliminate, to the extent possible, the threats that caused the species to be listed or of concern and any future threats; and (3) restore and conserve a healthy ecosystem function supportive of tidal marsh species. The goals and objectives of Phase 2 are in line with these goals.

Special-Status Wildlife Species

Special-status animal species that occur in or near the Phase 2 project areas are shown on Figure 3.5-2. The legal status and likelihood of occurrence of these species are listed in Table 3.5-2. There are three threatened or endangered species that are a focus of particular management efforts by the Refuge: salt marsh harvest mouse, California Ridgway's rail, and western snowy plover. A number of special-status species occur in the Phase 2 project area as visitors, migrants, or foragers but are not known or expected to breed in the immediate project area. Animals that occasionally occur within the project area and breed in upland habitats in the greater South Bay area, but occur only in the Phase 2 project area as uncommon to rare foragers, include the bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), Vaux's swift (*Chaetura vauxi*), California yellow warbler (*Dendroica petechia brewsteri*), bank swallow (*Riparia riparia*), and pallid bat (*Antrozous pallidus*). Species that occur in the project area regularly as foragers but have "special status" only at nesting sites elsewhere in California include the common loon (*Gavia immer*), American white pelican, Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), osprey (*Pandion haliaetus*), Barrow's goldeneye (*Bucephala islandica*), long-billed curlew (*Numenius americanus*), and elegant tern (*Sterna elegans*).

Table 3.5-1 Special-Status Plant Species Known to Occur within a 5-Mile Radius of and with Potential to Occur in the Phase 2 Ponds

NAME	STATUS*	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Threatened or Endangered Species			
San Mateo thorn-mint (*Acanthomintha duttonii*)	FE, SE, CRPR 1B	Chaparral, valley and foothill grassland, coastal scrub in relatively open areas. Only known to occur on very uncommon serpentinite vertisol clays. Elev. 50–200 meters(m).	**No potential to occur.** Only CNDDB occurrence within 5 miles is presumed extirpated. No appropriate habitat or suitable serpentinite substrate is present in the Phase 2 project area.
Robust spineflower (*Chorizanthe robusta* var. *robusta*)	FE, CRPR 1B	Cismontane woodland, coastal dunes, coastal scrub, growing on sandy terraces and bluffs or in loose sand. Elev. 3–120 m.	**No potential to occur.** Only CNDDB occurrence within 5 miles is a historical record from 1882. The Phase 2 project area does not include appropriate coastal habitat with sandy substrate.
Fountain thistle (*Cirsium fontinale* var. *fontinale*)	FE, SE, CRPR 1B	Valley and foothill grassland, chaparral, growing in serpentine seeps and grassland. Elev. 90–180 m.	**No potential to occur.** No serpentine seeps are present in the Phase 2 project area.
Marin western flax (*Hesperolinon congestum*)	FT, ST, CRPR 1B	Chaparral, valley and foothill grassland, growing in serpentine barrens and in serpentine grassland and chaparral. Elev. 30–365 m.	**No potential to occur.** No serpentine habitats are present in the Phase 2 project area.
Contra Costa goldfields (*Lasthenia conjugens)*	FE, CRPR 1B	Saline/alkaline vernal pools, mesic areas within grassland. Known from Alameda, Solano, Monterey, Contra Costa, and Napa Counties. Annual; blooms March through June. Elev. 4 – 180 m,	**No potential to occur.** Historically known from edges of salt ponds at the Bay shore near Mt. Eden and Newark. Occurs on the Warm Springs vernal pool unit of the Refuge (Fremont). No suitable habitat is present in the Phase 2 project area. Otherwise occurs in disjunct populations in Monterey and North Bay areas.
California seablite (*Suaeda californica*)	FE, CRPR 1B	Sandy, high-energy shorelines within salt marsh. Relictual populations in South Bay considered extirpated; known from the San Francisco Bay and Morro Bay, San Luis Obispo county. Elev. 0 – 160 m.	**Low potential to occur.** Suitable habitat occurs within Eden Landing and Ravenswood pond complexes and the species has been documented in salt marsh habitat at multiple locations in central San Francisco Bay.
Species of Concern and CRPR Species			
Franciscan onion (*Allium peninsulare* var. *franciscanum*)	CRPR 1B	Cismontane woodland, valley and foothill grassland, growing on clay soils or serpentine on dry hillsides. Elev. 100–300 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Kings Mountain manzanita (*Arctostaphylos regismontana*)	CRPR 1B	Broadleaved upland forest, chaparral, north coast coniferous forest, growing on granitic or sandstone outcrops. Elev. 305–730 m.	**No potential to** occur**.** No suitable habitat present in Phase 2 project area.
Alkali milk-vetch (*Astragalus tener* var. *tener*)	CRPR 1B	Alkaline soils in playas, vernal pools, and adobe clay areas within grassland. Alameda, Merced, Solano, and Yolo Counties. Annual; blooms March to June. Elev. 0 – 130 m.	**Low potential to occur.** A recently rediscovered population in seasonal wetlands at Warm Springs in Fremont. Considered extirpated from Santa Clara County. Currently no high-quality habitat in Phase 2 project area.

Table 3.5-1 Special-Status Plant Species Known to Occur within a 5-Mile Radius of and with Potential to Occur in the Phase 2 Ponds

NAME	STATUS*	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Brittlescale (*Atriplex depressa*)	CRPR 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually occurs in alkali scalds or clay in meadows or annual grassland. Elev. 1–320 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
San Joaquin saltbush (*Atriplex joaquiniana*)	CRPR 1B	Alkaline soils within chenopod scrub, meadows, playas, and grasslands in 14 Central California counties. Annual; blooms April through October. Elev. 0 – 750 m.	**No potential to occur.** Potentially occurs in seasonal wetlands in Warm Springs vicinity and known at Warm Springs. Currently, no suitable habitat present in Phase 2 project area.
Lesser saltscale (*Atriplex minuscula*)	CRPR 1B	Chenopod scrub, playas, valley and foothill grassland, in alkali sink and grassland in sandy, alkaline soils. Elev. 20–100 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)	CRPR 1B	Moist, alkaline soils within grassland. Tolerates disturbance. Annual; blooms June through November. Known from Alameda, Monterey, San Luis Obispo, and Santa Clara Counties. Elev. 0 – 260 m.	**Potential to occur.** Known from several locations in Newark, Fremont, Alviso, and Sunnyvale. Slight potential for occurrence in peripheral halophyte or disturbed upland zones in Phase 2 project area, but not currently associated with salt marsh.
Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*)	CRPR 1B	Coastal salt marsh habitats, growing with pickleweed and saltgrass, etc. Elev. 0–15 m.	**Low potential to occur.** Found in LaRiviere Marsh, Don Edward's Refuge, Fremont in 2010 and 2015 (R. Tertes, pers comm). Appropriate habitat is present in the fully tidal marshes of the Island Ponds and outside of other Phase 2 project areas.
Lost thistle (*Cirsium praeteriens*)	CRPR 1A	Little information is available about the habitat preferences of the species. Bloom period is June through July. Elev. 0 – 100 m.	**No potential to occur.** The species is known from only two collections made near Palo Alto (last in 1901) and is presumed extirpated in California.
San Francisco collinsia (*Collinsia multicolor*)	CRPR 1B	Closed-cone coniferous forest and coastal scrub, growing on decomposed shale (mudstone) mixed with humus. Elev. 30–250 m.	**No potential to occur.** No suitable forest or scrub habitats present in Phase 2 project area.
Western leatherwood (*Dirca occidentalis*)	CRPR 1B	Broad-leafed upland and riparian forest and woodlands, and chaparral, growing on brushy slopes, in mesic areas; mostly in mixed evergreen & foothill woodland communities. Elev. 30–550 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Small spikerush (dwarf spikerush) (*Eleocharis parvula*)	CRPR 4.3	Coastal and riparian marshes, swamps, and wetlands; blooms July and August. Elev. 1–3,000 m.	**Known to occur.** A population of small spikerush has been documented on the levee shoreline of Pond A19, occurring on exposed mud flat in three separate patches (Santa Clara Valley Water District 2014).

Table 3.5-1 Special-Status Plant Species Known to Occur within a 5-Mile Radius of and with Potential to Occur in the Phase 2 Ponds

NAME	STATUS*	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Hoover’s button-celery (*Eryngium aristulatum* var. *hooveri*)	CRPR 1B	Vernal pools, alkaline depressions, roadside ditches, and other wet places near the coast. Elev. 5–45 m.	**Low potential to occur.** Suitable habitat may be present in Phase 2 project area.
Fragrant fritillary (*Fritillaria liliacea*)	CRPR 1B	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported, though usually clay, in grassland. Elev. 3–410 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Arcuate bush-mallow (*Malacothamnus arcuatus*)	CRPR 1B	Chaparral on gravelly alluvium substrates. Elev. 80–355 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Davidson's bush-mallow (*Malacothamnus davidsonii*)	CRPR 1B	Coastal scrub, riparian woodland, chaparral, cismontane woodland, in sandy washes. Elev. 185–855 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Hall’s bush-mallow (*Malacothamnus hallii*)	CRPR 1B	Chaparral. Populations may occur on serpentine. Elev. 10–550 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Prostrate navarretia (*Navarretia prostrata*)	CRPR 1B	Seasonal wetlands and vernal pools within grassland and coastal scrub. Ranges from Monterey County south to San Diego. Annual; blooms April through July. Elev. 3 – 1210 m.	**No potential to occur.** In South Bay area, known only from Warm Springs in Fremont. Currently, no suitable habitat present in Phase 2 project area.
Hairless popcorn-flower (*Plagiobothrys glaber*)	CRPR 1A	Formerly known from alkali meadows and coastal salt marshes and swamps. Extirpated throughout its range; last documented occurrence in 1954, though possibly relocated near Antioch. Elev. 15 – 180 m.	**No potential to occur.** Presumed extinct.
Chaparral ragwort (*Senecio aphanactis*)	CRPR 2B	Chaparral, cismontane woodland, coastal scrub. drying alkaline flats. Elev. 15–800 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area.
Most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*)	CRPR 1B	Chaparral, valley and foothill grassland, cismontane woodland, growing on serpentine outcrops, on ridges and slopes. Elev. 120–730 m.	**No potential to occur.** No suitable habitat present in Phase 2 project area. Serpentine substrates are absent.

Table 3.5-1 Special-Status Plant Species Known to Occur within a 5-Mile Radius of and with Potential to Occur in the Phase 2 Ponds

NAME	STATUS*	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Slender-leaved pondweed (*Stuckenia filiformis* ssp. *alpina*)	CRPR 2B	Marshes and swamps (assorted shallow freshwater habitats). Elev. 300 – 2150 m.	**Low potential to occur.** Suitable habitat may be present in Phase 2 project area.
Saline clover (*Trifolium hydrophilum*)	CRPR 1B	Edges of salt marshes, alkali meadows, and vernal pools along the coast from Sonoma County south to San Luis Obispo as well as in the inland counties of Solano and Colusa. Annual; blooms April through June. Elev. 0 – 300 m.	**Low potential to occur.** Historic collection (type locality) from Belmont and documented in Fremont salt flats in 2004. Currently, no high-quality habitat present in the immediate Phase 2 project area.
Dwarf spikerush (*Eleocharis parvula*)	CRPR 4.3	Coastal and riparian marshes, swamps, and wetlands; blooms July and August. Elev. 1–3,000 m.	**Known to occur.** Individuals of this species have been found on a levee around Pond A19.

* Definitions: FE – Federally Endangered FT – Federally Threatened SE – State Endangered (California) ST – State Threatened (California) Sources: CNDDB 2013. Nomenclature from Baldwin et al. 2012.	CRPR – California Rare Plant Rank CRPR 1A – Plants considered extinct. CRPR 1B – Plants rare, threatened, or endangered in California and elsewhere. CRPR 2B – Plants rare, threatened, or endangered in California, but more common elsewhere. CRPR 4 – Plants of limited distribution – watch list.

Table 3.5-2 Special-Status Animal Species Known to Occur within a 5-Mile Radius of and Potential to Occur in the Phase 2 Ponds

NAME	STATUS	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Threatened or Endangered Species			
Green sturgeon, Southern Distinct Population Segment (DPS) (*Acipenser medirostris*)	FT	Spends majority of life in near-shore oceanic waters, bays, and estuaries; spawns in freshwater rivers.	**Known to occur.** Spawns in Sacramento River, but not known to spawn in South Bay. Present in the South Bay; unlikely to be inside ponds.
Steelhead – California Central Coast DPS (*Oncorhynchus mykiss irideus*)	FT	Cool streams with suitable spawning habitat and conditions allowing migration and marine habitats.	**Known to occur.** Known to be present in several South Bay creeks (including Coyote, Stevens, San Francisquito, and Alameda Creeks and the Guadalupe River) and associated slough channels within the project area. Suitable spawning habitat is not present in the project area, but this species moves through the area to spawn upstream.
Longfin smelt (*Spirinchus thaleichthys)*	FC, ST	Spends the majority of life in San Francisco Bay, moving upstream to spawn in low-salinity waters in winter/spring.	**Known to occur**. Occurs year-round in San Francisco Bay and known to occur in the South Bay.
California tiger salamander (*Ambystoma californiense*)	FT, ST, CSSC	Vernal or temporary pools in annual grasslands, or open stages of woodlands.	**Low potential to occur.** A population is present on Refuge lands in the Fremont/Warm Springs area, though not in the immediate SBSP pond complexes.
Bald eagle (*Haliaeetus leucocephalus*)	SFP, BCC	Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or in cliffs. Feeds mostly on fish.	**Low potential to occur.** Rare visitor, primarily during winter, to the project area. May occasionally forage, but does not nest, in the project area.
American peregrine falcon (*Falco peregrinus anatum*)	SFP, BCC	Forages in many habitats; nests on cliffs and similar human-made structures.	**Known to occur.** Regular forager (on other birds) in the project area, primarily during migration and winter. In the Alviso pond complex, individuals have nested on electrical towers regularly since at least 2006, and two pairs nested on towers in 2007.
California Ridgway's rail (*Rallus obsoletus obsoletus*)	FE, SE, SFP	Salt and brackish marsh habitat usually dominated by pickleweed and cordgrass.	**Known to occur.** Resident in many tidal marshes and sloughs in the project area. Large numbers are known to occur in Greco Island, immediately adjacent to the Ravenswood pond complex.
California least tern (*Sterna antillarum browni*)	FE, SE, SFP	Nests along the coast on bare or sparsely vegetated flat substrates.	**Known to occur.** The South Bay is an important post-breeding staging area for California least terns. Current Bay Area nesting sites include Alameda Point and Hayward Regional Shoreline. Has attempted to nest in small numbers at Eden Landing Pond E8A, but not in recent years. Forages and roosts in a number of South Bay ponds, especially Ponds A1 and A2W.

Table 3.5-2 Special-Status Animal Species Known to Occur within a 5-Mile Radius of and Potential to Occur in the Phase 2 Ponds

NAME	STATUS	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
California brown pelican (*Pelecanus occidentalis californicus*)	SFP	Occurs in near-shore marine habitats and coastal bays. Nests on islands in Mexico and Southern California.	**Known to occur.** Regular in project area during nonbreeding season (summer and fall). Roosts on levees in the interiors of pond complexes; forages in ponds and Bay.
Salt marsh harvest mouse (*Reithrodontomys r. raviventris*)	FE, SE, SFP	Salt marsh habitat dominated by pickleweed.	**Known to occur.** Resident in pickleweed marshes within the project area.
California black rail (*Laterallus jamaicensis coturniculus*)	ST, SFP	Breeds in fresh, brackish, and tidal salt marsh.	**Potential to occur.** Non-breeding individuals winter in small numbers in tidal marsh within the project area. Have been observed in small numbers during breeding seasons around the Island Ponds and potentially breeding in small numbers.
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT, CSSC, BCC	Nests on sandy beaches and salt panne habitats, including dry ponds.	**Known to occur.** Resident in the project area. Greatest numbers at Eden Landing and Ravenswood pond complexes. Additional birds occur in the project area during winter.
Bank swallow (*Riparia riparia*)	ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	**Potential to occur.** Observed in the project area as rare transient. No suitable breeding habitat in the project area.
State Species of Concern and Fully Protected Species			
Fall-run chinook salmon Central Valley Evolutionarily Significant Unit (ESU) (*Oncorhynchus tshawytscha*)	CSSC	Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.	**Known to occur.** Known to be present in several South Bay creeks (including Coyote Creek, Alameda Creek, and the Guadalupe River) and associated slough channels within the project area. Suitable spawning habitat is not present in the project area, but this species moves through the area to spawn upstream along some of these creeks.
Western pond turtle (*Actinemys marmorata*)	CSSC	Permanent or nearly permanent fresh or brackish water in a variety of habitats.	**Potential to occur.** Uncommon along the inshore side of Pond A3W but not within the pond itself. Occasionally found in freshwater and brackish creeks and sloughs elsewhere in the project area.
Common loon (*Gavia immer*)	CSSC (nesting)	Nests in freshwater marshes; winters in coastal marine habitats.	**Potential to occur.** Occasional winter visitor; does not breed in the project area.
American white pelican (*Pelecanus erythrorhnchos*)	CSSC (nesting)	Forages in freshwater lakes and rivers; nests on islands in lakes.	**Potential to occur.** Common non-breeder, foraging primarily on ponds in the project area. Regular visitor from late summer to spring. Not known to breed on-site.

Table 3.5-2 Special-Status Animal Species Known to Occur within a 5-Mile Radius of and Potential to Occur in the Phase 2 Ponds

NAME	STATUS	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Double-crested cormorant (*Phalacrocorax auritus*)	WL (nesting)	Colonial nester on coastal cliffs, offshore islands, electrical transmission towers, and along interior lake margins. Feeds on fish.	**Known to occur.** Breeds on electrical transmission towers and on levees within the project area and forages in ponds and other open water habitats in the project area.
White-faced ibis (*Plegadis chihi*)	WL (nesting)	Forages in freshwater marshes and, to a lesser extent, brackish areas.	**Potential to occur.** Occasional visitor in fall and winter. Has bred in heron rookery on Mallard Slough, but no current nesting known.
Barrow's goldeneye (*Bucephala islandica*)	CSSC (nesting)	Nests in freshwater marshes; winters in coastal marine habitats.	**Low potential to occur.** Uncommon winter visitor; does not breed in the project area.
Northern harrier (*Circus cyaneus*)	CSSC (nesting)	Nests and forages in marshes, grasslands, and ruderal habitats.	**Potential to occur.** Common year-round in the vicinity of the ponds. Breeds in small numbers in marsh in the project area; forages in a variety of habitats.
Sharp-shinned hawk (*Accipiter striatus*)	WL (nesting)	Nests in woodlands; forages in many habitats in winter and migration.	**Potential to occur.** Observed on-site as a migrant and winter resident. No breeding habitat in project area.
Cooper's hawk (*Accipiter cooperii*)	WL (nesting)	Nests in woodlands; forages in many habitats in winter and migration.	**Potential to occur.** Observed on-site as a migrant and winter resident. Breeds in limited numbers in upland habitats adjacent to the project area in the South Bay, but not within the immediate Phase 2 project area.
Osprey (*Pandion haliaetus*)	WL (nesting)	Nests in tall trees or cliffs on freshwater lakes and rivers and along seacoast; feeds on fish.	**Potential to occur.** Occasional forager, primarily during the nonbreeding season. Has nested in towers in the Fremont area, adjacent to the project area.
Golden eagle (*Aquila chrysaetos*)	SFP, WL, BCC	Breeds on cliffs or in large trees or electrical towers; forages in open areas.	**Potential to occur.** Occasional forager, primarily during the nonbreeding season. Known to nest in the Fremont/Milpitas area. No nesting records within the project area.
Merlin (*Falco columbarius*)	WL	Uses many habitats in winter and migration.	**Potential to occur.** Regular in low numbers during migration and winter. Does not nest in California.
Long-billed curlew (*Numenius americanus*)	WL, BCC (nesting)	Nests on prairies and short-grass fields; forages on mudflats, marshes, pastures, and agricultural fields.	**Potential to occur.** Forages on mudflats and marshes and roosts on levees, diked marshes, and ponds in the project area as a migrant and winter resident. Does not nest in the project area.
Black skimmer (*Rynchops niger*)	CSSC, BCC (nesting)	Nests on abandoned levees and islands in salt ponds and marshes.	**Known to occur.** A few pairs breed and forage in the project area on islands in ponds.
Short-eared owl (*Asio flammeus*)	CSSC (nesting)	Nests on ground in tall emergent vegetation or grasses; forages over a variety of open habitats.	**Potential to occur.** Uncommon in tidal marsh habitat in the area. Has bred in small numbers within the project area, although current breeding status unknown. Most numerous in project area in migration and winter.

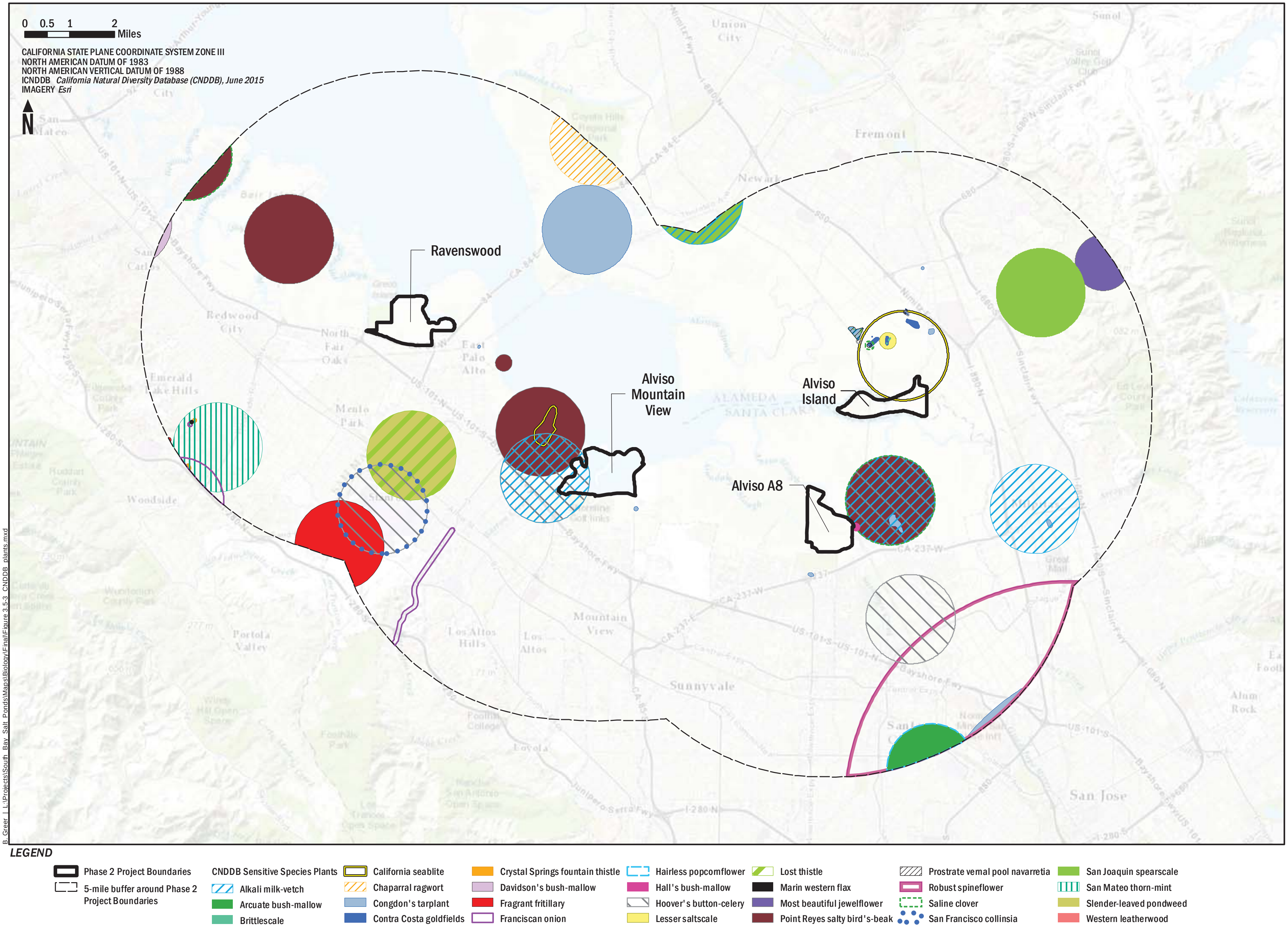
Table 3.5-2 Special-Status Animal Species Known to Occur within a 5-Mile Radius of and Potential to Occur in the Phase 2 Ponds

NAME	STATUS	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
Western burrowing owl (*Athene cunicularia hypogea*)	CSSC, BCC	Flat grasslands and ruderal habitats.	**Known to occur.** Nests at several upland sites immediately adjacent to the Phase 2 project area pond complexes (notably in the closed landfills that now form City of Mountain View's Shoreline Park [Alviso-Mountain View pond cluster]) and potentially at City of Menlo Park's Bedwell Bayfront Park [Ravenswood pond cluster], as well as the Warm Spring vernal pools north of project area; may forage within marshes and ponds to some extent. Uncommon along pond levees in winter.
Vaux's swift (*Chaetura vauxi*)	CSSC (nesting)	Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.	**Potential to occur.** Forages over project area during spring. No nesting habitat within area.
Loggerhead shrike (*Lanius ludovicianus*)	CSSC (nesting)	Nests in dense shrubs and trees; forages in grasslands, marshes, and ruderal habitats.	**Potential to occur.** Resident in low numbers within the project area.
California horned lark (*Eremophila alpestris actia*)	WL	Short-grass prairie, annual grasslands, coastal plains, and open fields.	**Potential to occur.** Common in the project area during nonbreeding season. May nest in small numbers on salt pond levees, salt flats, and ruderal habitats within project area.
California yellow warbler (*Dendroica petechia brewsteri*)	CSSC, BCC (nesting)	Breeds in riparian woodlands, particularly those dominated by willows and cottonwoods.	**Potential to occur.** Observed on-site as a migrant. No nesting habitat within the immediate SBSP pond complexes, but nests in riparian habitat upstream from the Bay, including areas within the South Bay.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	CSSC, BCC	Breeds primarily in fresh and brackish marshes in tall grass, tules, willows; low-density resident in salt marshes, which are used more in winter.	**Potential to occur.** Common resident, breeding in freshwater and brackish marshes and, to a lesser extent, in salt marshes; forages in all three marsh types during the nonbreeding season.
Alameda song sparrow (*Melospiza melodia pusillula*)	CSSC, BCC	Breeds in salt marsh, primarily in marsh gumplant and cordgrass along channels.	**Potential to occur.** Common resident, breeding and foraging in tidal salt marsh.
Tricolored blackbird (*Agelaius tricolor*)	Provisional Listing, CDFW (nesting)	Breeds near freshwater in dense emergent vegetation.	**Potential to occur.** May breed in extensive freshwater marshes around the periphery of the project area, such as at Coyote Hills. Occurs elsewhere in the project area as a nonbreeding forager.
Salt marsh wandering shrew (*Sorex vagrans halicoetes*)	CSSC	Occurs in middle and high marsh zones with abundant driftwood and pickleweed.	**Potential to occur.** May occur in salt marshes throughout the project area, though numbers have declined and current status is unknown.

Table 3.5-2 Special-Status Animal Species Known to Occur within a 5-Mile Radius of and Potential to Occur in the Phase 2 Ponds

NAME	STATUS	HABITAT/DESCRIPTION	POTENTIAL TO OCCUR
White-tailed kite (*Elanus caeruleus*)	SFP (nesting)	Nests in tall shrubs and trees; forages in grasslands, marshes, and ruderal habitats.	**Potential to occur.** Common resident; breeds at inland margins of the study site, where suitable nesting habitat occurs.

Definitions:	ST – State Threatened
FE – Federally Endangered	SFP – Fully Protected (California)
FT – Federally Threatened	CSSC – California Species of Special Concern
FC – Candidate for Federal Listing	WL – CDFW Watch List
BCC – USFWS Bird of Conservation Concern	Source:
SE – State Endangered	CNDDB 2014.



URS
South Bay Salt Pond Restoration Project

Figure 3.5-3
CNDDB Special-Status Plant Species

3.5.2 Regulatory Setting

This section discusses the regulations that are relevant to the biological resources of the Phase 2 project area.

Federal Regulations

Waters of the United States Regulations Overview

Areas meeting the regulatory definition of "Waters of the U.S." (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as Waters of the U.S., tributaries of waters otherwise defined as Waters of the U.S., the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to Waters of the U.S. (33 Code of Federal Regulations [CFR] Section 328.3[2]). Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Federal Endangered Species Act

FESA protects listed fish and wildlife species from harm or "take," which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury to a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under FESA if they occur on federal lands or if the project requires a federal action, such as a Section 404 fill permit.

USFWS has jurisdiction over federally listed threatened and endangered wildlife species under the FESA, and the National Marine Fisheries Service (NOAA Fisheries) has jurisdiction over federally listed, threatened, and endangered marine and anadromous fish. These agencies also maintain lists of species proposed for listing. Species on these lists are not legally protected under the FESA, but may become listed in the near future, and these agencies often include them in their review of a project.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) governs all fishery management activities that occur in federal waters within the U.S. 200-nautical-mile limit. The act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. These councils, with assistance from NOAA Fisheries, establish Essential Fish Habitat (EFH) in fishery management plans for all managed species. Federal agencies that fund, permit, or implement activities that may adversely affect

[2] 33 CFR 328.3, "Definition of Waters of the United States." 51 Federal Register 41250 (13 November 1986), as amended at 58 Federal Register 45036 (25 August 1993).

EFH are required to consult with NOAA Fisheries regarding potential adverse effects of their actions on EFH, and respond in writing to the recommendations of the NOAA Fisheries.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 United States Code [U.S.C.] § 703) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Marine Mammal Protection Act

The 1972 Marine Mammal Protection Act (16 U.S.C. §§ 1361–1407) was enacted to conserve marine mammals, including cetaceans, pinnipeds, and other marine mammal species. With certain exceptions, the act prohibits the taking and importation of marine mammals and products taken from them. Relevant to the Phase 2 project, this act prohibits harassment of marine mammals, including the harbor seal.

Coastal Zone Management Act

The 1972 Coastal Zone Management Act (16 U.S.C. §§ 1451–1464, Chapter 33) was passed to encourage coastal states to develop and implement coastal zone management plans. This act was established as a United States national policy to preserve, protect, develop, and where possible, restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations. See “San Francisco Bay Conservation and Development Commission” below for a discussion of how the act is implemented within San Francisco Bay.

State Regulations/Agencies

California Department of Fish and Wildlife Jurisdiction

Habitats potentially under the regulatory jurisdiction of CDFW are described under Division 2, Chapter 6, Sections 1600–1616 of the Fish and Game Code of California. Under Sections 1600–1607 of the Fish and Game Code of California, CDFW does not claim jurisdiction over saltwater habitats, including diked, muted, and tidal salt marsh similar to that found within the Phase 2 project area (CDFG 1994). Other sections of the Fish and Game Code of California protect various groups of wildlife species, including fish, crustaceans, mollusks, birds, mammals, reptiles, and amphibians.

California Endangered Species Act and Other Special-Status Species

The California Endangered Species Act (CESA) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with the CESA, CDFW has jurisdiction over state-listed species (California Fish and Game Code § 2070). CDFW also maintains lists of “species of special concern” that are defined as species that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats. CDFW also regulates “Fully Protected Animals”, a classification which was the State's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Most (but not all) Fully Protected Animals have also been listed as threatened or endangered species under the more recent state and federal endangered species laws and regulations.

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) is a California state agency. BCDC jurisdiction in the project area extends over the Bay, up to mean high tide and to 5 feet above mean sea level in marshes, and over a 100-foot shoreline band inland from the line of mean high tide or the line 5 feet above mean sea level adjacent to marshes. BCDC also has certain waterway jurisdiction in the project area, along Coyote Creek (and branches) in Alameda and Santa Clara Counties to the easternmost point of Newby Island. BCDC does not have 100-foot shoreline band jurisdiction adjacent to its certain waterway jurisdiction. BCDC also has salt pond jurisdiction, consisting of all areas that have been diked off from the Bay and have been used during the 3 years from August 1966 to August 1969 for the solar evaporation of Bay water in the course of salt production. The SBSP Restoration Project would require a BCDC permit or consistency determination for dredging and filling, shoreline improvements, or substantial changes in use. BCDC is responsible for enforcing the McAteer-Petris Act, which requires that "maximum feasible public access, consistent with a project be included as part of each project to be approved by the BCDC." BCDC is also responsible for determining consistency with the federal Coastal Zone Management Act.

The federal Coastal Zone Management Act and the California Coastal Act require the BCDC to review federal projects, projects that require federal approval or projects that are supported by federal funds. The BCDC Bay Plan (Bay Plan) promotes Bay conservation along with shoreline development and public access. BCDC has adopted policies that specifically address public access and wildlife compatibility, where in some "cases public access would be clearly inconsistent with the project because of public safety considerations or significant use conflicts, including unavoidable, significant adverse effects on Bay natural resources."

BCDC jurisdiction in the project area extends over the Bay, to 5 feet above mean sea level in marshes and over a 100-foot shoreline band inland from the line of mean high tide. The SBSP Restoration Project would require a BCDC permit for dredging and filling and shoreline improvements.

San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay Regional Water Quality Control Board (RWQCB) has primary authority for implementing provisions of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act. These statutes establish the process for developing and implementing planning, permitting, and enforcement authority for waste discharges to land and water. The *San Francisco Bay Basin (Region 2), Water Quality Control Plan (Basin Plan)* establishes beneficial uses for surface and groundwater resources and sets regulatory water quality objectives that are designed to protect those beneficial uses (RWQCB 2011). Under the current Basin Plan, designated beneficial uses of the San Francisco Bay Area's surface waters include municipal and domestic supply; agricultural supply; industrial service supply; groundwater recharge; contact and noncontact recreation; warm freshwater fish habitat; cold freshwater fish habitat; wildlife habitat; preservation of rare and endangered species; migration of aquatic organisms; and spawning, reproduction, and/or early development of fish.

The Basin Plan provides a program of actions designed to preserve and enhance water quality and to protect beneficial uses. It meets the requirements of the United States Environmental Protection Agency (USEPA) and establishes conditions related to discharges that must be met at all times.

The implementation portion of the Basin Plan includes descriptions of specific actions to be taken by local public entities and industries to comply with the Basin Plan's policies and objectives. These actions include measures for urban runoff management and wetland protection.

The SBSP Restoration Project would be designed to comply with RWQCB permitting requirements. USFWS and CDFW would prepare and conform to a Storm Water Pollution Prevention Plan (SWPPP), as required under the State Water Resources Control Board–implemented National Pollutant Discharge Elimination System (NPDES) permit program for construction activities and conform to an SWPPP, as required by the State Water Resources Control Board. The SWPPP would identify specific measures for reducing construction impacts such as erosion and sediment control measures.

The SBSP Restoration Project would involve construction activities that could adversely affect water quality, and therefore the Action Alternatives for each pond cluster would require acquisition of a Clean Water Act Section 401 water quality certification from the RWQCB.

The San Francisco Bay RWQCB also has established sediment screening criteria and testing requirements for the beneficial reuse of dredged material (e.g., wetlands creation, upland disposal). All sediment used for creation of upland habitat would be screened to meet wetland cover standards set by the RWQCB.

California Native Plant Society / California Rare Plant Rank

CNPS, a statewide, non-governmental conservation organization, working with CDFW and other organizations, has developed a ranking of plant species of concern in California. Vascular plants included on the California Rare Plant Rank (CRPR) are defined as follows:

> CRPR 1A: Plants considered extinct.
>
> CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere.
>
> CRPR 2: Plants rare, threatened, or endangered in California but more common elsewhere.
>
> CRPR 3: Plants about which more information is needed; these are on the CNPS "review list."
>
> CRPR 4: Plants of limited distribution; these are on the CNPS "watch list."

Although the CNPS is not a regulatory agency, and plants on the ranking have no regulatory protection under the federal or state Endangered Species Acts, plants appearing as CRPR 1B or CRPR 2 are, in general, considered to meet the California Environmental Quality Act (CEQA) Section 15380 criteria and adverse effects to these species are considered significant.

Regional/Local Regulations and Related Programs

San Francisco Estuary Invasive Spartina Project

The Invasive Spartina Project is in the process of implementing a coordinated, region-wide eradication program, comprising a number of on-the-ground treatment techniques to stave off a San Francisco Bay invasion of non-native cordgrass (*Spartina alterniflora* and its hybrids as well as *S. densiflora, S. patens,* and *S. anglica*) (CSCC and USFWS 2003). The Invasive Spartina Project is focused on the nearly 40,000 acres of tidal marsh and 29,000 acres of tidal flats that constitute the shoreline areas of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Sacramento Counties. The purpose of the Invasive Spartina Project is to arrest and reverse the spread of invasive non-native cordgrass species in the estuary to preserve and restore the ecological integrity of the estuary's intertidal habitats and estuarine ecosystem.

Association of Bay Area Governments San Francisco Bay Trail Plan

The plan for the Bay Trail proposes development of a regional hiking and bicycling trail around the perimeter of San Francisco and San Pablo Bays. The Bay Trail Plan was prepared by the Association of Bay Area Governments (ABAG) pursuant to Senate Bill 100 (1989), which mandated that the Bay Trail provide connections to existing park and recreation facilities; create links to existing and proposed transportation facilities; and be planned in such a way as to avoid adverse effects on environmentally sensitive areas. The Bay Trail Plan proposes an alignment for what is planned to become a 500-mile recreational "ring around the Bay."

Santa Clara Valley Water District

The Santa Clara Valley Water District (SCVWD) manages drinking water and flood protection for Santa Clara County. To help protect the valley's creeks and rivers, SCVWD recently adopted a new ordinance (replacing Ordinance 82-3) that requires a project review and permitting process to minimize impacts to watercourses resulting from development or community activities. Anyone who plans a project within 50 feet of a creek or waterway or within 50 feet of SCVWD property or easement must first obtain a permit from SCVWD's Community Projects Review Unit. To protect groundwater resources, SCVWD Ordinance 90-1 requires permitting for any person digging, boring, drilling, deepening, refurbishing, or destroying a water well, cathodic protection well, observation well, monitoring well, exploratory boring (45 feet or deeper), or other deep excavation that intersects the groundwater aquifers of Santa Clara County.

Alameda County Flood Control and Water Conservation District

The Alameda County Public Works Agency is responsible for maintaining the infrastructure of Alameda County—from its roads and bridges to flood channels and natural creeks. Within the Public Works Agency, the Alameda County Flood Control and Water Conservation District (ACFCWCD) works specifically to protect county citizens from flooding while preserving the natural environment. The Grading and Permits Division enforces a number of ordinances that may require a permit, such as the Watercourse Protection and Flood Plain Management ordinances. The SBSP Restoration Project would be designed to comply with local ordinances, and the project is working collaboratively with Alameda County and the ACFCWCD to determine if any permits will be required.

Permits Required

The following permits/approvals may be required from the agencies indicated:

- Section 404 Permit (USACE);
- Section 401 Water Quality Certification (RWQCB);
- BCDC Permit (BCDC);
- Biological Opinion (BO) (USFWS);
- BO, Essential Fish Habitat consultation and Marine Mammal Act Permit (NOAA Fisheries);

- Incidental Take Permit or Consistency Determination (CDFW); and
- Access and construction easements and/or permits from SCVWD, City of Menlo Park, City of Redwood City, City of Mountain View, and City of Palo Alto.

3.5.3 Environmental Impacts and Mitigation Measures

Overview

This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the SBSP Restoration Project, Phase 2. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.5.2, not the conditions that would occur under the No Action Alternative.[3] This approach follows the requirements of the National Environmental Policy Act (NEPA), CEQA, and what was done for the 2007 EIS/R. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) or in more general Refuge management plans such as the Comprehensive Conservation Plan (CCP). Mitigation measures are recommended, as necessary, to reduce significant impacts.

Significance Criteria

For the purposes of this Final EIS/R, a significant biological impact would occur if the project would result in any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

[3] "No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This Final EIS/R generally uses No Action throughout.

These bullet points are general descriptors of what types of changes would constitute a significant impact. Below, the first four points in this general list are developed into specific impacts to particular habitats, taxa, guilds, or species that were identified and chosen for individual analysis as part of the 2007 EIS/R.

The last two points are not directly considered as itemized impacts. However, this Final EIS/R considers those criteria implicitly as part of the overall impact assessment. Specifically, with regard to conflicting with local policies or ordinances, the SBSP Restoration Project has committed to comply with applicable local policies and regulations. Phase 2 project areas subject to those include, for example, Charleston Slough (City of Mountain View), levees surrounding ponds that could be altered (in the cities of Palo Alto and Mountain View and in the Santa Clara Valley Water District), and the portions of city parks that would be used for staging or material delivery (Bedwell Bayfront Park in Menlo Park and Shoreline Park in Mountain View). In these areas, the relevant jurisdictional agencies are project partners that have made their policies known and with whose input and participation the alternatives have been developed. These local agencies will also have permitting authority over those aspects of the project that would ensure that their policies and ordinances would be followed. There is no need for a numbered impact specifically assessing these regulations. Further, the Phase 2 project alternatives do not conflict with provisions of an adopted HCP; NCCP; or other relevant local, regional, or state regulations. The Santa Clara Valley Habitat Plan (a combined HCP and NCCP), for example, does not extend to the salt ponds or the streams adjacent to them.

The CEQA Guidelines indicate that an action would be significant if it had a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in a local or regional plan, policy, or regulation or by the USFWS or CDFW (AEP 2014). For species that use a single habitat type (e.g., only deep salt-pond habitat or cordgrass-dominated tidal salt marsh), determining whether Phase 2 would result in a substantial reduction in habitat is fairly straightforward. However, many species use a variety of habitats, including salt ponds, bay waters, intertidal areas, water treatment plants, and other habitats. Also, Phase 2 activities would not just result in a loss or gain of general habitat types such as “former salt pond,” but also a change in the conditions of those habitat types through species-targeted management (in the case of managed ponds) or carefully planned breaches and other measures to restore more extensive and more complex tidal marsh than currently exists in the South Bay. Although the extent of what is currently managed pond habitat would be reduced as a result of conversion to tidal habitats, the remaining managed ponds would be enhanced as part of various project phases and then actively managed for wildlife. As a result, making significance determinations simply on the basis of acreages of habitat loss or gain is not generally straightforward. Instead, in addition to assessing potential effects on individuals, this analysis considers habitat type, loss, or conversion in combination with species life histories, habitat needs, and overall population size and abundance in the South Bay to determine significance of impacts.

The 2007 EIS/R modeled habitat evolution in the South Bay under the three programmatic alternatives, and Point Reyes Bird Observatory (now called Point Blue) (Stralberg et al. 2006) performed modeling to predict bird population responses to changing habitat conditions under the three programmatic alternatives. The 2007 EIS/R predicted the acreage of various habitats important to wildlife species in the South Bay, including shallow and deep subtidal, intertidal, and low and high tidal marsh as well as the extent and size of tidal channels and marsh pannes within restored tidal marshes. The extent of these habitats was predicted at Year 0 (2008) and Year 50 (2058) for each of the alternatives. Using data gathered for the 2007 EIS/R tidal habitat predictions, predictions of the conditions within managed ponds provided by H.T. Harvey & Associates, and bird-habitat relationship data from 6 years (1999–2004) of

Point Blue's avian surveys in tidal marsh and salt pond habitats, Stralberg et al. (2006) developed models to predict numbers of key bird species in the SBSP Restoration Project area, and in the South Bay as a whole at Year 50 under each of the three alternatives.

The baseline for determining the significance of potential impacts under NEPA and CEQA for the purposes of this Final EIS/R is the existing condition of the project area. However, South Bay populations of many plants and animals may vary considerably from one year to the next, and thus a longer-term average (e.g., in numbers of individuals of a particular species) is used where appropriate to establish baseline conditions and determine whether deviations from that condition would result in a significant impact. Triggers for action that are addressed in the AMP are designed to ensure, to the greatest extent possible, that the project not have significant adverse impacts and will be effective in achieving the project objectives. The discussion of impacts herein focuses on whether impacts would reach a level of significance under NEPA and CEQA.

Establishing thresholds of significance, determining the significance of impacts, and establishing adaptive management triggers for biological resources for the SBSP Restoration Project are complicated by several factors, as described in the 2007 EIR/S. These factors are summarized below.

- The lack of a clear, quantifiable baseline (i.e., status/abundance originally in 2006 or during preparation of this document between 2013 and 2015) for many potential species impacts makes it difficult to identify a quantitative threshold of significance. For example, interannual variability in shorebird numbers requires many years of bird surveys to establish a baseline quantitatively, yet the available data on South Bay birds may not accurately describe existing conditions for NEPA/CEQA baseline purposes.

- The most intensive, standardized surveys were conducted either before ISP implementation (Point Blue) or while conditions in the ponds were changing due to Cargill's preparation for the sale of the ponds and due to ISP implementation (USGS).

- Most such surveys covered the ponds and did not include the associated bay habitats such as mudflats and subtidal areas, which may be affected by the project.

- The inherent variability in South Bay plant and wildlife communities makes it difficult to determine whether a quantitative threshold of significance has been exceeded. For example, if the threshold of significance for project impacts to small migratory shorebirds was set at 20 percent below baseline conditions, the interannual variability in shorebird numbers in the South Bay would result in numbers that, in some years, would drop below the threshold, even if the project was not involved.

- A number of factors external to the SBSP Restoration Project will affect the biological resources using the South Bay. For example, global climate change and sea-level rise may have much greater effects on numbers of migratory shorebirds present in the South Bay than would changes resulting directly from the project. As restoration proceeds and key biological parameters (e.g., shorebird numbers) are monitored, it will be challenging to distinguish trends (e.g., declines in abundance of small migratory shorebirds) that actually result from project activities from trends resulting from external factors, yet such a distinction will be important to avoid significant project impacts.

- Some biological resources are expected to decline even in the absence of the project, which may exaggerate impacts actually attributable to the SBSP Restoration Project. For example, the loss of outboard mudflats due to existing processes of sediment dynamics in the Bay and sea-level rise is expected to occur regardless of the alternative selected; this loss would cause a number of species to be affected (negatively and positively) even under the No Action Alternative. Separating the changes that are not related to the SBSP Restoration Project from those changes caused by the various alternatives is a considerable challenge.
- The SBSP Restoration Project sets forth restoration targets and thresholds of significance that in some instances are related to each other but are not identical. For example, the restoration target for small migratory shorebirds is "Maintain small shorebird numbers at pre-ISP levels," yet these population levels differ from the NEPA/CEQA baseline used in the 2007 EIS/R (which is a percentage change in the small shorebird population relative to fall 2006 numbers). These similar but not identical targets lead to a complication wherein maintaining populations at 90 percent of pre-ISP levels could occur, which would be a failure to achieve a restoration target but not severe enough to trigger a significance determination. Although these differences do not necessarily affect the determination of the NEPA/CEQA threshold of significance for small migratory shorebirds, they complicate the link between the adaptive management triggers and the threshold of significance in the monitoring and adaptive management process that would be used to avoid significant impacts.

In the summaries of thresholds of significance for specific biological resources impacts discussed below, the term "substantial" is frequently used to indicate the level of impact (e.g., a decline in numbers of a particular species or group) that would be considered significant under NEPA and CEQA. Neither NEPA nor CEQA guidelines provide a clear definition of the term "substantial" as it applies to the magnitude of an impact (e.g., to a species' populations, habitat, or range) that would be considered significant. Therefore, in determining the threshold of significance for a particular species or group of species for the SBSP Restoration Project, both the magnitude of impacts to South Bay populations and the contribution of South Bay populations to larger-scale (i.e., regional, flyway-level, continental, and range-wide) populations were considered. As a result, thresholds of significance may vary among different taxa (e.g., percent declines in numbers that would be considered significant may vary among some impacts discussed below). Except where a specific percent decline is noted in a particular significance threshold, a decline of 10 to 20 percent in South Bay numbers or 5 to 10 percent in flyway-level numbers (for birds) would generally be considered "substantial."

Thresholds of significance for potential project impacts to specific biological resources are discussed below. If at any point during the 50-year SBSP Restoration Project, a numerical threshold is exceeded or a qualitative threshold is reached for a given impact and that change has resulted from the SBSP Restoration Project, a significant impact would have occurred. However, monitoring and Adaptive Management are integral components of the SBSP Restoration Project and would be critical in preventing adverse effects from reaching a level of significance. The Adaptive Management triggers would be set to warn of potential impacts and allow Adaptive Management to be undertaken to reverse or forestall such impacts before such a point will have been reached. The rationale for each impact includes a description of how the threshold of significance was selected, indicates how the threshold of significance is related to the restoration target and the triggers, and illustrates how monitoring and Adaptive Management would be used to avoid a significant impact.

Although both the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.1, Chapter Organization, for a description of the terminology used to explain the severity of the impacts.

In Table 3.5-3, the threshold of significance is briefly described for each potential biological resources impact. Except where otherwise noted, the impacts and the thresholds of significance are the same as those presented in the 2007 EIS/R. Next, potential impacts and related adaptive management information are discussed, first in a summary form for the Programmatic SBSP Restoration Project ("Program-Level Evaluation") and then for the Phase 2 projects ("Project-Level Evaluation").

Table 3.5-3 Biological Impact Significance Thresholds

IMPACT	THRESHOLD OF SIGNIFICANCE
3.5-1: Potential reduction in numbers of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	The SBSP Restoration Project would have a significant impact on small shorebirds if it resulted in a substantial reduction in numbers (i.e., a decline of 20 percent below baseline levels as a result of the SBSP Restoration Project) of the most abundant species (i.e., semipalmated plover (*Charadrius semipalmatus*), western sandpiper (*Calidris mauri*), least sandpiper, dunlin (*Calidris alpina*), short-billed dowitcher [*Limnodromus griseus*], and long-billed dowitcher [*Limnodromus scolopaceus*]) in the South Bay, resulting in a substantial decline in flyway-level populations.
3.5-2: Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	The threshold of significance for this impact is defined as measurable, long-term loss of intertidal mudflat area not compensated for by equivalent increases in productivity as a result of SBSP Restoration Project activities.
3.5-3: Potential habitat conversion impacts to western snowy plovers.	The SBSP Restoration Project would have a significant impact on western snowy plovers if it resulted in a decline in the adult breeding-season population within San Francisco Bay (relative to the NEPA/CEQA baseline).
3.5-4: Potential reduction in the population size of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other project-related effects.	The SBSP Restoration Project would have a significant impact if it resulted in a decline of 10 percent or greater (relative to the NEPA/CEQA baseline) in the number of breeding black-necked stilts, American avocets, Caspian terns, or Forster’s terns breeding in the San Francisco Bay Area.
3.5-5: Potential reduction in the population size of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte’s gulls as a result of habitat loss.	The SBSP Restoration Project would have a significant impact on salt-pond-specialist waterbirds (i.e., eared grebes, Bonaparte’s gulls [*Chroicocephalus philadelphia*]), Wilson’s phalaropes, and red-necked phalaropes) if it resulted in the loss of a substantial number of individuals (i.e., a decline of 50 percent below baseline levels as a result of the SBSP Restoration Project) of these species from the South Bay, resulting in a substantial decline in flyway-level populations, due to a reduction in the extent of higher-salinity ponds and the conversion of managed ponds to tidal habitats.
3.5-6: Potential reduction in foraging habitat for diving ducks, resulting in a substantial decline in flyway-level populations.	The SBSP Restoration Project would have a significant impact on diving ducks foraging in the South Bay if it resulted in a substantial reduction in numbers (i.e., a decline of 20 percent below baseline levels as a result of the SBSP Restoration Project) of diving ducks using the South Bay, resulting in a substantial decline in flyway-level populations, due to the conversion of managed ponds to tidal habitats.
3.5-7: Potential reduction in foraging habitat for ruddy ducks, resulting in a substantial decline in flyway-level populations.	The SBSP Restoration Project would have a significant impact on ruddy ducks foraging in the South Bay if it resulted in a substantial reduction in numbers of individuals (i.e., a real decline of 15 percent below baseline levels as a result of the SBSP Restoration Project) using the South Bay, resulting in a substantial decline in flyway-level populations, due to the conversion of managed ponds to tidal habitats.
3.5-8: Potential habitat conversion impacts on California least terns.	The SBSP Restoration Project would have a significant impact on California least terns if it resulted in a decrease in foraging habitat or prey availability for post-breeding dispersants in the South Bay, leading to a decline in the Bay Area breeding population relative to baseline levels.

Table 3.5-3 Biological Impact Significance Thresholds

IMPACT	THRESHOLD OF SIGNIFICANCE
3.5-9: Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew and further isolation of these species' populations due to breaching activities and scour.	The threshold of significance for this impact is defined as measurable, sustained loss of pickleweed-dominated tidal salt marsh resulting in substantial isolation of salt marsh harvest mouse and salt marsh wandering shrew populations due to the SBSP Restoration Project, without development of a commensurate amount of new contiguous marsh once the appropriate elevations are achieved within the restored ponds.
3.5-10: Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	The SBSP Restoration Project would have a significant impact on marsh-associated species if it resulted in the mortality of, or the loss of active nests of, substantial numbers of state- or federally listed marsh-associated species or abandonment of a primary harbor seal haul-out or pupping area as a result of the SBSP Restoration Project.
3.5-11: Potential construction-related loss of or disturbance to nesting pond-associated birds.	Loss of any individuals or nests of the federally listed western snowy plover would be significant given the low west coast populations of this species. The loss of a substantial number of active nests and/or chicks of other pond-associated species, such as Forster's and Caspian terns, American avocets, and black-necked stilts, due to breaching of ponds and other construction-related activities during the nesting season would also be a significant impact.
3.5-12: Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	The SBSP Restoration Project would have a significant impact on biological resources as a result of ongoing monitoring, management, and maintenance activities if these activities resulted, directly or indirectly (e.g., by facilitating predation), in: ▪ The mortality of, or loss of active nests of, any western snowy plovers or California least terns; ▪ The mortality of, or the loss of active nests of, substantial numbers of state- or federally listed, marsh-associated species; ▪ Abandonment of a primary harbor seal haul-out or pupping area; ▪ The loss of substantial numbers of nests of non-listed pond-associated birds such as terns, avocets, and stilts; or ▪ Disturbance or harm to plant species of concern.
3.5-13: Potential effects of habitat conversion and pond management on steelhead.	The SBSP Restoration Project would have a significant impact on steelhead if it resulted in a decline in steelhead populations associated with South Bay spawning streams.
3.5-14: Potential impacts to estuarine fish.	The SBSP Restoration Project would result in a significant impact to estuarine fish if it resulted in a substantial decline in South Bay populations of estuarine fish.
3.5-15: Potential impacts to piscivorous birds.	The SBSP Restoration Project would result in a significant impact to piscivorous birds if it resulted in a substantial decline (relative to baseline levels) in South Bay populations of mergansers, pelicans, fish-eating grebes, herons, and egrets, resulting in a substantial decline in Pacific Flyway populations.
3.5-16: Potential impacts to dabbling ducks.	The SBSP Restoration Project would have a significant impact to dabbling ducks if it resulted in a substantial decline (relative to baseline levels) in South Bay populations of dabbling ducks, resulting in a substantial decline in Pacific Flyway populations.
3.5-17: Potential impacts to harbor seals.	The SBSP Restoration Project would result in a significant impact to harbor seals if it resulted in a substantial decline (relative to baseline levels) in South Bay populations.

Table 3.5-3 Biological Impact Significance Thresholds

IMPACT	THRESHOLD OF SIGNIFICANCE
3.5-18: Potential recreation-oriented impacts to sensitive species and their habitats.	Recreation associated with the SBSP Restoration Project would have a significant impact if it resulted, directly or indirectly (e.g., by facilitating predation), in: ▪ The abandonment of a primary harbor seal haul-out or pupping area; ▪ The mortality of, or loss of active nests of, western snowy plovers or California least terns; ▪ A reduction in California Ridgway's rail populations; ▪ The loss of substantial numbers of nests of non-listed pond-associated birds (specifically, terns, avocets, and stilts); ▪ Substantial, long-term declines in numbers of waterbirds in the South Bay due to recreational disturbance; or ▪ Losses of California Ridgway's rail or salt marsh harvest mouse individuals by impeding the use of high-tide refugia under or near public access features.
3.5-19: Potential impacts to special-status plants.	The threshold of significance for this impact is defined as the loss of individuals of a state- or federally listed plant species, or loss of a substantial portion of the population of other special-status plants (e.g., species considered rare under the CRPR), as a result of SBSP Restoration Project activities without commensurate increases in numbers as a result of restoration of tidal and transitional habitats.
3.5-20: Colonization of mudflats and marsh plain by non-native *Spartina* and its hybrids.	The threshold of significance is defined as colonization of restored tidal habitats by non-native *Spartina* at a level (measured by percentage of the vegetated marsh dominated by non-native *Spartina*) that exceeds recently colonized marshes elsewhere in the South Bay.
3.5-21: Colonization by non-native *Lepidium*.	The threshold of significance is defined as colonization of restored brackish marsh habitats by *Lepidium latifolium* at a level (measured by percentage of the vegetated marsh dominated by *Lepidium latifolium*) that exceeds recently colonized reference brackish marshes elsewhere in the South Bay.
3.5-22: Increase in exposure of wildlife to avian botulism and other diseases.	The threshold of significance is defined as a substantial increase in the incidence of avian botulism or other wildlife diseases in the South Bay, or an increase in the number of individuals exposed to such diseases, relative to baseline conditions as a result of the SBSP Restoration Project.
3.5-23: Potential impacts to bay shrimp populations.	The threshold of significance is defined as a substantial decrease in numbers of California bay shrimp within the South Bay as a result of the SBSP Restoration Project.
3.5-24: Potential impacts to jurisdictional wetlands or waters.	The threshold of significance for this impact is defined as measurable, long-term loss of jurisdictional wetlands or waters not compensated for by equivalent increases in jurisdictional wetlands or waters as a result of SBSP Restoration Project activities.
3.5-25: Potential construction-related loss of, or disturbance to, nesting raptors (including burrowing owls [*Athene cunicularia*]).	The SBSP Restoration Project would have a significant impact on raptors if it resulted in the mortality of, or the loss of active nests of, raptors (including burrowing owls), as a result of the SBSP Restoration Project.

Program-Level Evaluation Summary

In the 2007 EIS/R, the analysis determined that Programmatic Alternative C was beneficial or would have less-than-significant impacts to almost all species and habitats when evaluated at the full program scale. The only potentially significant adverse biological impacts identified for Programmatic Alternative C was to ruddy ducks (*Oxyura jamaicensis*). Construction-related impacts (that would generally be temporary and localized) would also occur under Programmatic Alternatives B and C; no construction-related impacts would occur under Programmatic Alternative A.

Programmatic Alternative C was chosen, and implementation of Phase 1 actions began. The actions proposed under completed Phase 1 actions in combination with Phase 2 actions will continue to move the overall mix of habitats toward 50 percent restored tidal marsh, after which future phases can continue progressing toward the mix of habitats described for Programmatic Alternative C.

Project-Level Evaluation

Project-level evaluation is described below for each of the 25 identified potential biological resource impacts. Of these 25 impacts, 23 are the same ones used in the 2007 EIS/R. However, two new impacts were added for consideration here. Impact 3.5-24 covers the potential impacts to jurisdictional wetlands or waters. This impact was added to more specifically call out and assess the changes to jurisdictional wetlands that would occur as part of connecting former salt ponds with tidal flows. Many of the ponds are surrounded by fringing marsh that would necessarily have channels excavated through them, and the Project Management Team (PMT) wanted to explicitly account for and analyze those channels. Impact 3.5-25 covers potential construction-related loss of, or disturbance to, nesting raptors (including burrowing owls). This impact was added at the request of project partners that own and manage public lands or infrastructure adjacent to the SBSP Restoration Project that are known to be raptor habitat. It was appropriate to make an explicit assessment of the construction-related impacts to those birds.

Phase 2 Impact 3.5-1: Potential reduction in numbers of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.

Several species of small shorebirds (examples of common species include semipalmated plover, western sandpiper, least sandpiper, dunlin, short-billed dowitcher, and long-billed dowitcher) occur in the San Francisco Bay Area, primarily during migration and in winter (roughly July through April). San Francisco Bay is one of the most important stopover and wintering areas on the west coast for these species. Within San Francisco Bay, the majority of these birds are typically found in the South Bay.

In the South Bay, these small shorebirds forage primarily on intertidal mudflats at low tide and to a lesser extent along the margins of ponds or in shallow ponds. These birds roost and nest on sandy or gravel islands, salt flats, and levees.

Restoration of former salt ponds to tidal habitats is expected to increase the availability of intertidal mudflat foraging area at low tide in the short term, as some of the breached ponds would provide intertidal mudflat habitat for some time before accreting enough sediment to become vegetated. However, in the long term, sedimentation patterns of the South Bay are expected to result in a loss of intertidal mudflat, both due to conversion to emerging fringe marsh and conversion to subtidal habitat due to scour as a result of increased tidal flux and eventually because of sea-level rise. This mudflat loss is predicted to occur even in the absence of the SBSP Restoration Project, but mudflat loss is expected to be greater if ponds are breached and tidal habitats restored (2007 EIS/R). However, intertidal mudflats are the dominant habitat of the South Bay, and only a small percentage of the total area of mudflats is within the Phase 2 area and would be affected by Phase 2 actions.

In addition to causing changes in the extent of mudflats, tidal restoration of what are currently managed ponds would reduce the availability of high-tide roosting habitat for small shorebirds. The extent of shallow-water habitat that may be used by foraging small shorebirds (estimated as the extent of managed ponds containing water less than 6 inches deep) would vary considerably among the alternatives. High-tide roosting habitat is unlikely to limit populations, as pond levees, islands, and other alternative habitats can support high densities of roosting birds. However, conversion of managed ponds to tidal habitats would reduce the numbers of sites where shorebirds can congregate at high tide, potentially resulting in increased predation, possibly increased susceptibility to disease, and increased disturbance (and associated increases in energy expenditure) by predators and humans.

Pond-cluster-specific discussion of this impact follows.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of ISP actions. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Because these ponds currently function as tidal marsh habitat, low-tide mudflats would continue to be available for foraging shorebirds in the short term. In the long-term, most of the mudflats would become vegetated and thus unavailable to small shorebirds, although narrow intertidal mudflats along marsh channels and sloughs would remain as foraging habitat for small shorebirds at low tides.

Minor degradation to levees may occur over time, but generally, the existing levees would continue to serve as potential roosting locations and would not be significantly affected. The reductions to small shorebird habitat are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. Therefore, impacts under Alternative Island A would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, sediment accretion would continue but in a more spatially diverse way because of the additional breach locations and other levee and pond modifications. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would continue to create mudflat habitat for small shorebirds in the short term. In the long-term, most of the mudflats would become vegetated and thus unavailable to small shorebirds, although narrow intertidal mudflats along marsh channels and sloughs would remain as foraging habitat for small shorebirds. Although the Island Ponds are already breached and on their way toward becoming vegetated tidal marshes, the changes proposed under Alternative Island B would improve habitat connectivity and complexity for tidal marsh habitat.

The minimal levee alterations would have a minor effect on roosting habitat. The reductions to small shorebird habitat are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. Therefore, impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, all the components of Alternative Island B are included with the addition of more levee breaches at Ponds A20 and A21, levee lowering along Pond A20, and breach expansion and pilot channels cut into Pond A19. The purpose is to further add habitat connectivity and complexity and improve the spatial distribution of sediment accretion as the ponds transition to tidal marsh. Impacts for Alternative C are similar to the impacts for Alternative B but with additional points of tidal flow entry into ponds and increased lengths of altered levees.

The levee alterations would be a minor effect on roosting habitat. The reductions to small shorebird habitat are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. Therefore, impacts under Alternative Island C are considered less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place. Ponds A1 and A2W would remain as limited managed ponds. Charleston Slough would remain a muted tidal mudflat. Levees would be maintained, and the ponds would continue to provide the same habitat functions as they do now. Existing trails would continue to be maintained and used for recreational access. Currently the ponds and levees provide minimal habitat for small shorebirds; Charleston Slough provides extensive foraging habitat for them at low tide.

Because the habitat would not change relative to baseline and the ponds and surrounding levees and mudflats currently provide habitat, Alternative Mountain View A would have no impact on shorebirds.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, levees would be breached to restore tidal flows to Ponds A1 and A2W. The large extent of tidal marsh that would be restored in Ponds A1 and A2W would be an improvement in shorebird habitat over the deep-water conditions that currently exist. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's outboard (bayside) levee, raise and improve the existing boardwalk within Pond A2W, and add more concrete to expand the footings around the bases of transmission towers. In the short term, the ponds would remain filled with water, but due to levee breaches would become tidal. With time, sedimentation would raise the pond bottom, providing mudflat habitat for foraging at low tide. Once sediment accretion has reached a level that supports tidal marsh vegetation, small shorebird foraging habitat would be locally reduced; however, due to the abundance of mudflat habitat in the South Bay, this change would not be significant. Narrow intertidal mudflats along marsh channels and sloughs would continue to provide small amounts of foraging habitat for small shorebirds.

The boardwalk to be added north of Pond A1's bayside levee would have a very small impact on existing mudflat habitat that could be used for foraging shorebirds. The Pond A2W eastern levee is already used for access, so access improvements here are not expected to have long-term effects on roosting habitat, though there could be short-term construction-related impacts. Roosting habitat for shorebirds would be created through the construction of several islands in Ponds A1 and A2W. Islands would also provide high-tide refuge for small shorebirds and better protection from predators compared to the levees. Habitat transition zones would be constructed to increase habitat complexity. A habitat transition zone would provide a gradual slope that would increase the intertidal area over time. This area would provide some foraging habitat for small shorebirds. As the habitat transition zones vegetate, their value for foraging for small shorebirds would decrease.

Alternative Mountain View B would have a net increase in foraging and roosting habitat for shorebirds in the short term. The effects of the levee breaching and PG&E infrastructure improvements on roosting habitat would be minimal. The reductions to small shorebird habitat are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. Therefore, the impacts of Alternative Mountain View B are considered less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Under Alternative Mountain View C, additional breaches in Pond A1 would be added to enhance habitat connectivity and add more points of tidal exchange. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C. In addition, Charleston Slough would be breached and connected to Pond A1, facilitating the transition of the slough's mudflats to tidal marsh. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. As Charleston Slough evolves into tidal marsh, much of the current intertidal mudflat and the associated foraging habitat for shorebirds in the slough would be lost. The conversion of 53 acres of Charleston Slough to tidal marsh is a requirement of a BCDC permit obtained by the City of Mountain View when it took ownership of Charleston Slough from Cargill/Leslie Salt, the previous owner. This transition is supposed to be occurring already, but Mountain View has not been successful in previous efforts to begin establishing tidal marsh in the slough. Under Alternative C, this transition would be facilitated and expected to take place.

On a local scale, Charleston Slough is an important resource and foraging area for small shorebirds. Thus, the conversion of the slough to tidal marsh would locally decrease tidal mudflats and a portion of the forage habitat they provide. This loss is not expected to be relevant on a flyway-population scale, however, and due to the presence of large amounts of mudflat habitat throughout the South Bay this decrease in foraging habitat is not expected to be limiting for small shorebird populations. Therefore, this transition to tidal marsh is a not significant impact on foraging habitat for small shorebirds.

Under Alternative Mountain View C, trail improvements and additions are proposed for the western levee along Charleston Slough. Because a popular trail currently exists on the western Charleston Slough levee, an improved trail in the same location is not expected to significantly increase long-term disturbance to roosting shorebirds, though there would be short-term construction impacts. On the other side of the pond cluster, a new trail is proposed along the eastern border of Pond A2W. These levees currently provide limited potential roosting habitat for small shorebirds. The new trail proposed along the eastern border of Pond A2W would be located on a levee that is already used for PG&E and Refuge access, but it is expected that the recreational access would be more disturbing to roosting due to the increased use of the levee by bicyclists and people on foot. The PG&E infrastructure impacts would be similar to those described for Alternative Mountain View B. The relocation of the intake structure would result in temporary construction impacts, but would not have long-term impacts on shorebirds. The construction of nesting islands, which would be located away from levees to minimize disturbance from recreation, would provide roosting habitat and would mitigate for the roosting habitat lost where the new trail/infrastructure would be located. Habitat transition zones would also be constructed along the southern border of Ponds A1 and A2W, potentially providing foraging habitat for shorebirds in the short and medium term. As the habitat transition zones vegetate, their value for foraging for small shorebirds would decrease.

The large extent of tidal marsh that would be restored in Ponds A1 and A2W would be an improvement in shorebird habitat over the deep-water conditions in those ponds now. Also, the temporary intertidal mudflat and upland areas on levees, islands, and habitat transition zones would provide roosting and foraging habitat for small shorebirds. These features, along with suitable habitat for small shorebirds available in other locations around the project ponds and the plentiful availability of mudflat throughout the South Bay, are expected to benefit small shorebirds, offsetting the loss of intertidal mudflat habitat in Charleston Slough. The reductions to small shorebird habitat are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. For these reasons, the impacts of Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Phase 1 actions. The A8 Ponds are managed as subtidal ponds with muted tidal action. During the summer months, they are managed as deep-water habitat, and during the wet season, water levels may be drawn down to provide flood storage capacity for the Santa Clara Valley Water District. Also, the armored notch is opened following the end of outmigration of juvenile salmonids and closed again before the next outmigration begins. The width and duration of this opening is part of ongoing experiments and monitoring as part of the project's AMP and are unrelated to Phase 2 project implementation. These operations have minimal effects on small shorebird populations. With regard to birds, the A8 Ponds are used largely as forage habitat by diving and dabbling birds. Suitable habitat for small shorebirds is minimal in these ponds.

No changes to the A8 Ponds would take place under Alternative A8 A. Therefore, small shorebirds would not be impacted.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B actions would include the addition of two habitat transition zones to the interior of the ponds. Current management practices would not change due to these additions, though they may change as part of the AMP and SBSP Restoration Project's Science Program. Overall habitat function and pond water management would be the same as described in the No Action Alternative. With the exception of the habitat transition zones and additional fill, the ponds would continue to be managed in the same manner. Existing small shorebird habitat would not be adversely impacted. Potentially, the habitat transition zones would provide additional foraging and roosting habitat. Any reductions to small shorebird habitat that may occur are not expected to produce substantial declines in flyway-level populations or reduce the populations 20 percent below baseline levels. Therefore, Alternative A8 B would have no impact under CEQA and be beneficial under NEPA.

Alternative A8 B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are currently isolated from tidal action and bay connectivity. The dry salt flats present in summer months are ideal habitat for nesting western snowy plovers, which are treated separately in Impact 3.5-3 and so not considered in this impact. In the winter and spring months, the seasonal ponds provide shallow water foraging habitat for small shorebirds. Outer levees would be maintained for flood control so that the ponds would not transition into tidal marsh. Under the No Action Alternative, there would be no change in impacts to small shorebird habitat or populations.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be converted to tidal marsh. A habitat transition zone would also be created in Pond R4. Ponds R5 and S5 would be restored to enhanced managed pond habitat. The intertidal areas along the marsh channels and sloughs found in the restored tidal marshes that would develop in Pond R4 and the habitat transition zone are expected to continue providing foraging habitat for small shorebirds. Pond R3 would remain a seasonal pond that would continue to provide high-tide roosting habitat. A water control structure would be installed on Pond R3 to allow for better control of water levels and water quality in the borrow ditches and historic slough traces within Pond R3. Water control structures would also allow direct management of water quality in that pond, which is expected to improve the habitat for shorebirds during winter, in particular. The diversified tidal marsh expected to develop in Pond R4 would offer shelter and some foraging habitat for small shorebirds. The increased foraging and roosting in the habitat transition zones and the improved foraging along the marsh channels and sloughs would benefit small shorebird foraging; however, they would be impacted by the loss of nesting habitat within the currently seasonal ponds. Due to the abundance of shorebird habitat throughout the South Bay, this reduction would have a less-than-significant impact on small shorebird populations through the completion of Phase 2 projects and is unlikely to reduce flyway-level populations 20 percent below baseline levels. Future project phases would depend on the AMP and other program-level decision-making processes to determine whether additional habitat conversion would bring a significant impact.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C is similar to Alternative Ravenswood B with the exception of certain features designed to increase small shorebird habitat. First, Ponds R5 and S5 would be enhanced managed ponds, graded and operated to simulate intertidal mudflats. These ponds would provide foraging habitat for shorebirds and an easily accessible viewing opportunity for bird-watchers. Second, a second water control structure installed on Pond R3 would allow for better control of water levels and water quality in the borrow ditches and historic slough traces within Pond R3. Water control structures would also allow direct management of water quality in that pond, which is expected to improve the habitat for shorebirds during winter, in particular. An additional habitat transition zone would be constructed to provide additional high-tide roosting habitat and foraging habitat for shorebirds. Finally, the diversified tidal marsh expected to develop in Pond R4 would offer shelter and foraging habitat for small shorebirds, offsetting the reduction of the seasonal pond habitat that currently exists in Pond R4. The increased foraging habitat in Ponds R5 and S5 would be a benefit to small shorebirds. Therefore, the impact of Alternative Ravenswood C is considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Alternative Ravenswood D is similar to Alternatives Ravenswood B and Ravenswood C with the exception that Ponds R5 and S5 would be enhanced managed ponds modified to accept peak stormwater runoff flows from the nearby Bayfront Canal. When not being used for such temporary salinity treatment and stormwater detention, they would be managed to provide deep-water habitat for diving and dabbling ducks as opposed to shorebirds. This change would require that water levels in Ponds R5 and S5 be lowered before storm events in the winter to provide flood storage capacity. Also, the salinity in these ponds would be reduced due to the freshwater storm runoff. In the summer, the ponds would function as managed ponds, as proposed in Alternative Ravenswood B. The addition of freshwater flows into Ponds R5 and S5 would not have a significant impact on small shorebirds. Like Alternative Ravenswood B, the diversified tidal marsh expected to develop in Pond R4 and the creation of habitat transition zones would offer shelter and foraging habitat for small shorebirds, offsetting the seasonal pond habitat that currently exists in Pond R4. Due to the abundance of shorebird habitat throughout the South Bay, the reduction in pond habitat would have a less-than-significant impact on small shorebirds through the completion of Phase 2 projects and is unlikely to reduce flyway-level populations 20 percent below baseline levels. Future project phases would depend on the AMP and other program-level decision-making processes to determine whether additional habitat conversion would bring a significant impact.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-2: Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.

Potential program-level impacts are addressed in Section 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 actions are assessed.

Shorebirds are the primary users of intertidal mudflats, and the habitat- and population-related effects on small shorebirds from Phase 2 actions were covered extensively in Impact 3.5-1. Resident and migratory shorebirds forage on invertebrates found in mudflats during low tide. Gulls and some dabbling ducks forage on exposed mudflats as well. During high tides, fish move over these mudflats to feed on invertebrates.

Restoration of former salt ponds to tidal habitats is expected to increase the availability of intertidal mudflat foraging area at low tide within the ponds in the short term. Some of the breached ponds would provide large areas of intertidal mudflat habitat for some time before accreting enough sediment for vegetation to colonize. Eventually, this mudflat habitat within the ponds would be converted to tidal marsh.

Mudflats outside of the ponds could be affected by scour and changes in sediment transport. As the ponds are breached, increased tidal flux is expected to cause short-term scouring and loss of some of the mudflat area outside of the ponds alongside stream outflows, sloughs, and channels until an equilibrium has been reached. Mudflat loss is also expected as ponds are breached because sediments from existing mudflats would be transported into the breached subsided ponds and the ponds would then be colonized with vegetation (2007 EIS/R). However, intertidal mudflats are one of the dominant habitats of the South Bay (the other being former salt-ponds), and only a minimal percentage of the total area of mudflats would be affected by the Phase 2 actions.

Numerous species of invertebrates, birds, and fish use intertidal mudflats. As a result, a decline in mudflat availability could result in declines in abundance of these species; however, because the Phase 2 project areas represent a small fraction of the total South Bay mudflat area, these declines would be minimal. Also, productivity within the former salt ponds is expected to increase with tidal restoration, as tidal water brings nutrients and organisms into the salt ponds. Though not known with certainty, tidal marsh restoration is expected to result in increased productivity in the benthic invertebrate food chain, potentially increasing the density of the invertebrate prey base available to the various bird and fish species that forage on intertidal mudflats. Such increases in productivity may offset, at least to some extent, the adverse effects of mudflat loss outside of the ponds on South Bay animals such as invertebrates, fish, and birds. In addition, minimal amounts of foraging habitat for some mudflat foragers would be created along the margins of the sloughs and channels that would form in restored marshes, as discussed in the 2007 EIS/R.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. These ponds are currently transitioning to vegetated tidal marsh habitat as a result of activities implemented under the ISP. Because these ponds have been opened to tidal action, some intertidal mudflats currently exist within the ponds and will provide habitat functions in the short term. In the long term, most of the mudflats within the ponds would become vegetated as sediment accretion continues. As the breaches expand with time or the levees erode, increasing the tidal prism, some mudflat habitat along the Coyote Creek or Mud Slough channels outside of the ponds could be scoured and lost. In the long term, an equilibrium in the mudflat would be reached.

In the developed tidal marsh, narrow intertidal mudflats along marsh channels and sloughs would form and provide habitat for mudflat-associated wildlife species. Compared to pre-breach conditions, mudflat habitat has been increasing and would continue to do so in the short term as the levees scour away and erode. In the long term, the area of mudflats would decrease as the ponds become vegetated, though some mudflat habitat would remain along the channels and sloughs. Relative to the existing amounts of mudflat habitat for wildlife species in the South Bay, this change would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, actions—including breaching, lowering, and removing different portions of the levees around Ponds A19 and A20—would be taken to enhance the habitat connectivity during and after the transition to tidal marsh. Pond A19's levees would be breached and lowered along Mud Slough, and the levees between Ponds A19 and A20 would be removed. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

Like Alternative Island A, mudflat habitat would continue to increase in the short term, and the longer-term transition to tidal marsh would proceed in a similar manner. Scour along Mud Slough would be greater under Alternative Island B due to the increased tidal prism in that waterway. However, scour in Coyote Creek may be reduced somewhat. In the long term, some mudflat habitat would be available within the transitional areas from marsh plain to channel along the channel networks that develop within the ponds and also potentially in areas where sidecast material is placed. The change in mudflat area (increases within the ponds and decreases outside of the ponds) would be minimal relative to the existing amount of mudflat habitat in the South Bay; as a result, Alternative Island B would have a less-than-significant impact on mudflat habitat for wildlife species in the South Bay.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, all the components of Alternative Island B are included with the addition of more levee breaches, additional levee lowering at Pond A20, and the cutting of pilot channels into Pond A19. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The purpose is to further increase habitat connectivity during and after the transition from ponds to tidal marsh.

Like Alternatives Island A and Island B, mudflat habitat would continue to exist in the short term but decrease over the long term. Scour along Mud Slough would be greater in that waterway due to the increased tidal flux. However, scour in Coyote Creek may be reduced somewhat. The changes in mudflat habitat would be similar to those described in Alternative B and minimal relative to the existing amount of mudflat habitat in the South Bay; as a result, Alternative Island C would have a less-than-significant impact on mudflat habitat for wildlife species in the South Bay.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. Ponds A1 and A2W are managed ponds. Levees would be maintained and the ponds would continue to provide the same habitat function. Currently the only intertidal mudflat habitat within the boundaries of the Phase 2 analysis for the Mountain View Ponds is in Charleston Slough and in a narrow area along Mountain View Slough between Ponds A1 and A2W. Intertidal mudflats also exist outside the Phase 2 ponds on the bayward sides of Mountain View Slough and Whisman Slough below Stevens Creek. None of these mudflats would be disturbed with the No Action Alternative; therefore, Alternative Mountain View A would have no impact on intertidal mudflat habitat for wildlife species in the South Bay.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain B, levees would be breached to restore tidal action to Ponds A1 and A2W. Ponds A1 and A2W would gradually transition to tidal marsh. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of

Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add more concrete to expand the footings around the bases of transmission towers.

The construction of the boardwalk north of Pond A1's bayside levee would reduce the total availability of mudflat habitat, though this amount is minimal relative to the amount of mudflat in the Bay and the mudflat habitat that would be created by the project. Sediment accretion during the transition to tidal marsh would result in temporary intertidal mudflat habitat, though it could take many years for these deeply subsided ponds to reach the elevation necessary to create mudflats. This mudflat habitat would in turn become vegetated as a tidal marsh. The existing mudflats along and outside of Mountain View Slough and Whisman Slough would likely experience some scour and reduced area. The existing mudflats in Charleston Slough would not be affected.

The planned tidal restoration would likely eventually result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity. Intertidal mudflat habitat is expected to develop along the channels and sloughs in the restored tidal marsh and along the shallow sloping features of the habitat transition zones and islands There would also be some loss of mudflat due to scour from the increased tidal flux outside of the ponds and in adjacent sloughs. The addition of the habitat transition zones and the creation of interior channels would result in a small amount of increase in intertidal mudflat habitat around these features. The net of these areas of change to existing mudflats is expected to be small and would thus constitute a less-than-significant impact on mudflat habitats for wildlife species in the South Bay.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C also proposes to restore tidal action to the ponds, but there would be more breaches into Ponds A1 and A2W to improve the habitat connectivity of the restoration in these ponds. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C. In addition, Charleston Slough would be breached, and the levee between it and Pond A1 would be lowered, providing tidal action to facilitate the transition of Charleston Slough's existing mudflats to tidal marsh. The south and west levees of Charleston Slough will be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

The impacts of the PG&E infrastructure improvement on the mudflats would be the same as under Alternative Mountain View B, where slight reductions would occur north of the Pond A1 bayside levee. Additional actions proposed for PG&E and recreational access are not expected to impact the mudflats.

As Charleston Slough's mudflat habitat transitions into tidal marsh, much of the current intertidal mudflat in the slough would be lost. The conversion of 53 acres of Charleston Slough to tidal marsh is a requirement of a BCDC permit obtained by the City of Mountain View when it took ownership of Charleston Slough from Cargill/Leslie Salt, the previous owner. This transition is supposed to be occurring already, but Mountain View has not been successful in previous efforts to begin establishing tidal marsh in the slough. With time, even in the absence of a Phase 2 action at the Mountain View Ponds, Charleston Slough is intended to transition to tidal marsh. Under Alternative Mountain View C, the Phase 2 actions would cause this transition to occur sooner and with more certainty.

On a local scale, Charleston Slough is an important resource mudflat-associated wildlife species. The conversion of the slough to tidal marsh would locally decrease tidal mudflats and a portion of the habitat they provide. However, and due to the presence of large amounts of mudflat habitat throughout the South Bay this decrease is not expected to be limiting for populations of mudflat-associate species.

Like Alternative Mountain View B, there may also be some loss of mudflat due to scour from the increased tidal flux outside of the ponds and in adjacent sloughs under Alternative Mountain View C. The planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity. The addition of habitat transition zones and the creation of marsh channels and sloughs would result in a small amount of long-term increase in the development of intertidal mudflat habitat around these features.

As noted, one goal of Alternative Mountain View C is to assist mudflats in Charleston Slough to transition to tidal marsh, so there would necessarily be some loss of that mudflat. However, due to the presence of substantial amounts of mudflat habitat elsewhere in the South Bay, the impacts of these small changes in mudflat habitat for wildlife species would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. Ponds A8 and A8S would continue to be managed as reversibly muted tidal habitat. Intertidal mudflats are not a significant habitat at the A8 Ponds; those mudflats that are present would not be affected by the No Action Alternative.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern levee of Pond A8S. The A8 Ponds are currently deeply subsided, so the construction of habitat transition zones would not directly reduce the area of existing mudflats. The gradual slope of the habitat transition zones would increase suitable conditions for intertidal mudflat habitat to develop. Overall intertidal mudflat habitat increases at the A8 Ponds would be minimal compared to the extent of mudflats in the South Bay. Because no intertidal mudflat is present at the A8 Ponds and the Phase 2 actions would have no effect on any adjacent mudflats, Alternative A8 B would have a less-than-significant impact on mudflat habitat for wildlife species in the South Bay.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action and do not contain intertidal mudflat habitat. The areas of intertidal mudflat that exist in the adjacent sloughs and outside of the pond complex would remain in their current condition. Under the No Action Alternative, it is expected that intertidal mudflats would not be impacted.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be converted to tidal marsh by breaching it to restore tidal flows. A habitat transition zone would also be created in Pond R4. Ponds R5 and S5 would be enhanced managed pond habitat, and Pond R3 would receive a water control structure on its outer levee to allow more active management of water levels within the pond. This structure may improve foraging habitat by allowing tidal water to enter historic sloughs, but would have little impact on mudflat habitat.

No intertidal mudflat habitat exists in these ponds; however, there is mudflat outside of the ponds in the adjacent sloughs and bay. There could be some scouring of these existing tidal mudflats as a result of the increased tidal flux. However, after a time, equilibrium would be reached, and mudflats are expected to re-form along the new channel and slough margins. During the transition to tidal marsh, intertidal mudflat habitat would also temporarily increase in Pond R4 as sediment accretion raises the pond elevation to a level that can support tidal marsh vegetation. After conversion to tidal marsh, these temporary mudflats would become vegetated, and intertidal mudflat habitat would remain along marsh channels and sloughs.

Alternative Ravenswood B would result in temporary and beneficial formation of mudflats and small changes in existing mudflats along the margins of the adjacent sloughs. These changes to mudflat habitat are minor compared to the amount of existing mudflat habitat for wildlife species in the South Bay, and therefore the impact of these changes would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C is similar to Alternative Ravenswood B with the exception of certain features designed to increase intertidal mudflat habitat. With regard to mudflats, the main difference between the alternatives is that under Alternative C Ponds R5 and S5 would be converted to simulated intertidal mudflats and that an additional habitat transition zone would be built along the southern levee of Pond R4. Two water control structures would also be installed at Pond R3. These structures may improve foraging habitat by allowing tidal water to enter historic sloughs, but would have little impact on mudflat habitat.

The increases in mudflat habitat in Ponds R5 and S5 in Alternative Ravenswood C would be greater than the relatively minor and/or temporary impacts discussed for Alternative Ravenswood B. This increase would lead to Alternative C having a less-than-significant impact under CEQA and being beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Alternative Ravenswood D is similar to Alternative Ravenswood B with the exception that Ponds R5 and S5 would be enhanced managed ponds that would also be modified to accept peak stormwater runoff flows from the nearby Bayfront Canal and Atherton Channel. When not being used for such temporary stormwater detention and salinity treatment, these ponds would be managed to provide habitat for diving and dabbling ducks as opposed to shorebirds. Like Alternative Ravenswood C, Alternative D would also provide water control structures on Pond R3.

The additional intertidal mudflat habitat along the historic sloughs of the restored tidal marsh in Pond R4 and the intertidal mudflat along the gradual slopes of habitat transition zones would slightly increase overall intertidal mudflat habitat relative to baseline. Small changes in mudflat habitat for wildlife species outside of the ponds as a result of scour from the increased tidal flux would result in an impact that is considered less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-3: Potential habitat conversion impacts to western snowy plovers.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the South Bay Salt Pond Restoration Project's 2007 EIS/R. The project-level impacts of the implementation of Phase 2 are assessed in this Final EIS/R.

Western snowy plovers have found suitable breeding and nesting conditions in some former salt ponds . Plovers prefer open spaces with no vegetation, away from trails and predator perches. Plovers often nest on former salt-production ponds with salt-encrusted surfaces that are dry during the spring and summer nesting seasons, though the levees of remote ponds and islands in ponds have also been used. Although western snowy plovers in San Francisco Bay occasionally nest on levees and islands, the majority of nests are currently found on flats within dry or partially dry ponds (2007 EIS/R). Individuals could also forage in adjacent shallow ponds or tidal sloughs. Some of these ponds would be converted to tidal marsh during pond restoration efforts, potentially impacting western snowy plover habitat. Recovery goals for the entire San Francisco Bay are to support 250 breeding pairs. Recovery goals for the SBSP Restoration Project area are to support 125 breeding pairs. The Pacific Coast population of this species is federally listed as threatened and substantial losses in the San Francisco Bay population could be significant in the context of the Pacific Coast population (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). The Island Ponds currently do not provide snowy plover habitat, and changes in this pond cluster would neither increase nor decrease snowy plover habitat. Alternative Island A would have no impact on western snowy plover.

Alternative Island A Level of Significance: No Impact

Alternative Island B. The Island Ponds currently do not provide snowy plover habitat and changes in this pond cluster would neither increase nor decrease snowy plover habitat. Alternative Island B would have no impact on western snowy plover.

Alternative Island B Level of Significance: No Impact

Alternative Island C. The Island Ponds currently do not provide snowy plover habitat and changes in this pond cluster would neither increase nor decrease snowy plover habitat. Alternative Island C would have no impact on western snowy plover.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds currently do not provide snowy plover habitat, and changes in this pond cluster would neither increase or decrease snowy plover habitat. Alternative Mountain View A would have no impact on western snowy plover.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be converted to tidal marsh. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add more concrete to expand the footings around the bases of transmission towers.

Neither deep pools nor tidal marsh habitats are well-suited for western snowy plover, but the transitional mudflat habitat would provide temporary foraging opportunities for western snowy plover. Construction of the PG&E boardwalk north of Pond A1 would have some small impacts on mudflat habitat, but due to the lack of nesting habitat in the area, it is not likely that this area is heavily used by foraging plovers. The islands that would be built in Ponds A1 and A2W could provide some western snowy plover habitat, but an existing gull colony in Pond A1 may limit the success of nesting on these islands without management efforts to control gull use of that area. The creation of the islands would help offset the minor losses of existing nesting or roosting habitat on the outboard levees of the ponds, but these levees are not known to have been used by plovers. Because habitat is limited and impacts and benefits balance, the impacts on western snowy plover under Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C is similar to Alternative Mountain View B with the addition of more breaches in Pond A1 levees and levee lowering between Pond A1 and Charleston Slough to increase the speed of tidal marsh transition. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative Mountain View C. Alternative C also has minor changes to the habitat transition zone and increased recreational access.

The impacts of PG&E infrastructure improvements would be the same as under Alternative Mountain View B. Like Alternative B, islands would be built in Ponds A1 and A2W to provide nesting habitat that could benefit snowy plovers, but would likely be used by other species unless managed specifically for snowy plovers. The creation of the islands would help offset the minor losses of existing nesting and roosting habitat along the outboard levees that would be lost through levee breaches or disturbed through recreational trails; however, snowy plovers have not been seen using these levees to nest in the past.

The mudflat habitat in Charleston Slough could serve as foraging habitat for western snowy plovers during low tide. Although this area is already designed to transition to tidal marsh, under Alternative Mountain View C, this transition would be facilitated, decreasing the availability of this foraging habitat sooner. Due to the existing abundance of intertidal mudflats in the South Bay, the loss of this mudflat would be a less-than-significant impact on western snowy plover.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. During Phase 1, Pond A8 was converted to a deep, muted tidal habitat, which is not conducive to snowy plover nesting. The A8 Ponds currently do not provide snowy plover habitat, and changes in this pond cluster would neither increase nor decrease snowy plover habitat. Alternative A8 A would have no impact on western snowy plover.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create a habitat transition zone along the southern levee of Pond A8S. The A8 Ponds currently do not provide snowy plover habitat, and changes in this pond cluster would neither increase nor decrease snowy plover habitat. Alternative A8 B would have no impact on western snowy plover.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), all Ravenswood Ponds would function as managed seasonal ponds, and outboard levees would be maintained to provide flood protection. Seasonal ponds that are dry in the spring and summer provide suitable snowy plover habitat, and snowy plover nests have been observed at Ponds R4 and R3. Ponds R5 and S5 are also dry seasonal ponds, but they are less frequently used by western snowy plovers because of their small size and proximity to heavily used hiking trails in the adjacent Bedwell Bayfront Park and along the Bay Trail. Ponds R3 and R4 are suitable for snowy plover nesting, because they are dry during the summer months, when snowy plovers are nesting. Thus, they are able to build their nests on the dry salt flats. There are no large trees or towers that would act as predator perches for raptors on these salt flats, and the salt flats are isolated from human disturbances due to the lack of trails accessing the inner and outer levees of the ponds. These larger ponds receive more frequent plover nesting activity.

Independent of the SBSP Restoration Project's Phase 2 actions, the Project Management Team is already planning and implementing a number of habitat enhancements and other management techniques to increase western snowy plover populations. These techniques may include treating the nesting substrates with shells and other surfaces to increase camouflage and thus nesting success (as is taking place at CDFW-owned Eden Landing), constructing habitat islands for to provide isolated nesting areas (as at Eden Landing Ponds E12 and E13 as well as Refuge Ponds A16 and SF2), social attraction experiments currently underway at Ponds SF2 and A16, and harassing predator species. Regardless of which Phase 2 alternative is selected for Phase 2, the Refuge will continue to actively monitor and manage for western snowy plover, adapt and reapply the results of these experiments, and implement the appropriate actions to maintain snowy plover populations and protect their habitat.

Under the No Action Alternative, there would be no impacts to snowy plover habitat or individuals. The Ravenswood Ponds would continue to provide suitable nesting habitat for snowy plovers.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, actions with potential to impact snowy plover habitat include conversion of existing snowy plover habitat in Pond R4 to tidal marsh and in Ponds R5 and S5 to enhanced managed pond habitat. Thus, suitable western snowy plover habitat would be lost in Ponds R4, R5, and S5, though of these three ponds, Pond R4 has been most frequently and repeatedly used for plover nesting. Pond R3 would remain a seasonal pond, though it would be enhanced to improve the nesting and forage habitat quality for western snowy plover.

Under Alternative Ravenswood B, a habitat transition zone would be added to the western edge of Pond R4, but due to the proximity of existing trails, this habitat transition zone would not make ideal snowy plover foraging habitat. An improved levee would be added between Ponds R3 and R4; this levee would not be connected to existing trails and could be used as potential snowy plover nesting habitat. A partial levee would remain as an island in Ponds R5 and S5 which could also be used for nesting by snowy plover. Finally, a fence would be installed along the southern margin of Pond R3 between it and the paved Bay Trail spine. This fence would discourage people and their dogs from entering the pond basin itself and would thereby provide a benefit to snowy plovers.

Alternative Ravenswood B would result in the loss of snowy plover habitat in Pond R4 but would preserve and enhance the habitat in Pond R3. A water control structure would be added to the eastern levee of Pond R3 to connect it to Ravenswood Slough. This structure would allow Refuge staff to control water levels and thereby provide improvements to foraging habitat by increasing circulation in the existing borrow ditches and the historic slough traces in Pond R3. Snowy plovers are opportunistic breeders, moving around the South Bay to take advantage of ponds with suitable conditions. Therefore, loss of habitat in the Ravenswood Ponds could potentially be offset by the availability of suitable habitat in or around other South Bay ponds.

Independent of the SBSP Restoration Project's Phase 2 actions, the Project Management Team is already planning and implementing a number of habitat enhancements and other management techniques to increase western snowy plover populations. These techniques may include treating the nesting substrates with shells and other surfaces to increase camouflage and thus nesting success (as is taking place at CDFW-owned Eden Landing), constructing habitat islands for to provide isolated nesting areas (as at Eden Landing Ponds E12 and E13 as well as Refuge Pond SF2), social attraction experiments currently underway at Ponds SF2 and A16, and harassing predator species. Regardless of which Phase 2 alternative is selected for Phase 2, the Refuge and CDFW will continue to actively monitor and manage for western snowy plover, adapt and reapply the results of these experiments, and implement the appropriate actions to maintain snowy plover populations and protect their habitat. Finally, other project features in Phase 2 (e.g., islands created at the Mountain View Ponds) could provide some supplemental nesting habitat.

For these reasons, particularly the improvement of habitat enhancements in Pond R3 and the Refuge management techniques described above, impacts to western snowy plover from habitat conversion under Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. In Alternative Ravenswood C, seasonal nesting habitat for snowy plovers would be lost in Ponds R4, R5, and S5, as described for Alternative Ravenswood B. Also as in Alternative Ravenswood B, the water control structure at Pond R3's eastern levee would be added to improve water level management and enhance plover habitat. In Alternative Ravenswood C, however, an additional water control structure would be added to the western side of Pond R3 at its intersection with Pond S5 to further improve control over water levels and overall snowy plover habitat. Also, a habitat transition zone would be added along the proposed improved levee between Ponds R3 and R4. Ponds R5 and S5 would be managed as intertidal mudflats. A partial levee would remain as an island in Ponds R5 and S5; this partial levee could provide potential snowy plover nesting habitat. The mudflats would provide potential foraging habitat. Finally, a fence would be installed along the southern margin of Pond R3 between it and the paved Bay Trail spine. This fence would discourage people and their dogs from entering the pond basin itself and would thereby provide a benefit to the snowy plover.

Actions under Alternative Ravenswood C would result in the loss of snowy plover habitat in Pond R4 but would preserve and enhance the habitat in Pond R3. Snowy plovers are opportunistic breeders, moving around the South Bay to take advantage of locations with suitable conditions. Therefore, loss of habitat in the Ravenswood Ponds could potentially be offset by improved suitable habitat in other ponds. In addition, the same ongoing experiments and management actions to maintain or increase western snowy plover population described in Alternative Ravenswood B (e.g., adding nesting islands, improving nesting substrate enhancements, predator harassment, social attraction experiments) would be implemented in Alternative Ravenswood C.

The improved habitat in Pond R3 is expected to improve nesting success and offset the loss of western snowy plover habitat elsewhere at the Ravenswood Ponds. The overall impact of western snowy plover habitat conversion would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would provide similar snowy plover habitat changes as Alternative Ravenswood C with the exception of Ponds R5 and S5 being managed as enhanced managed ponds instead of mudflats. Ponds R5 and S5 would be configured to accept peak stormwater runoff from the Bayfront Canal during storm events. Alternative D would provide the same water control structures in Pond R3 to improve snowy plover habitat as in Alternative C. Finally, a fence would be installed along the southern margin of Pond R3 between it and the paved Bay Trail spine. This fence would discourage people and their dogs from entering the pond basin itself.

Actions under Alternative Ravenswood D would result in the loss of snowy plover habitat in Pond R4 but would preserve and enhance the habitat in Pond R3. Snowy plovers are opportunistic breeders, moving around the South Bay to take advantage of ponds with suitable conditions. Therefore, loss of habitat in the Ravenswood Ponds could potentially be offset by the availability of suitable habitat in other South Bay ponds. In addition, the same ongoing experiments and management actions to maintain or increase western snowy plover population described in Alternative Ravenswood B (e.g., adding nesting islands, improving nesting substrate enhancements, predator harassment, social attraction experiments) would be implemented in Alternative Ravenswood D.

The improved habitat in Pond R3 is expected to improve nesting success and offset the loss of western snowy plover habitat elsewhere in the Ravenswood Ponds. The overall impact of western snowy plover habitat conversion would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-4: Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other project-related effects.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. The project-level impacts of the implementation of Phase 2 are assessed in this Final EIS/R.

American avocets, black-necked stilts, Forster's terns, and Caspian terns are colonial waterbirds that nest and forage within portions of the SBSP Restoration Project. These birds nest on islands within ponds and on pond levees, in dry salt panne habitat, in marshes on higher ground around marsh ponds, and in other bayside habitats such as water treatment plant settling ponds. Avocets and stilts forage in ponds, marshes, ponds, and alternative habitats such as water treatment plants. Avocets also forage on intertidal mudflats when they are not inundated. The terns forage on fish, which they catch in the Bay; along slough channels; in lower-salinity ponds within the SBSP Restoration Project area; and in artificial ponds, lagoons, and reservoirs throughout the South Bay (2007 EIS/R).

Restoration of managed ponds to tidal marsh could result in a loss of nesting and foraging habitat. Large areas of unoccupied nesting habitat are available and could offset habitat loss due to conversion to tidal marsh. If available habitat is concentrated, it could make populations more vulnerable to predation. California gulls use the same habitat type as avocets, stilts, and terns. Gulls displaced by loss of nesting habitat due to tidal marsh restoration could disrupt avocet, stilt, and tern colonies (2007 EIS/R).

Overall, the loss of habitat in ponds that would be converted to tidal habitats in Phase 2 is expected to impact relatively small numbers of breeding avocets, stilts, and terns through loss of nesting and foraging habitat. These adverse impacts may be offset by the creation of nesting islands for these species and the improvements to other ponds that are designated to become enhanced managed ponds as part of Phase 2 or a future project phase. Furthermore, the adverse impacts that may result from the encroachment of displaced California gulls on other pond-associated nesting birds would be addressed by active gull management implemented under the AMP.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP. The Island Ponds currently provide limited roosting habitat for pond-associated water birds on the levees surrounding the ponds; under Alternative Island A, these levees will degrade over time. The shallow ponds and developing intertidal mudflats would provide short-term foraging habitat. The adjacent sloughs and channels that form within the marsh over time are expected to provide improved habitat for fish and invertebrates that make up the diet of pond-associated waterbirds.

Under Alternative Island A, there would be small changes in available roosting, and foraging habitat for pond-associated waterbirds over time. These changes are unlikely to cause the populations of pond-associated waterbirds to decline 10 percent or greater relative to the NEPA/CEQA baseline and would therefore constitute a less than significant impact.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, actions would be taken to continue the transition of the Island Ponds to tidal marsh and enhance habitat connectivity while doing so. Pond A19’s levees would be breached along Mud Slough and lowered. Internal levees between Ponds A19 and A20 would be removed to improve the habitat connectivity and quality of those ponds for juvenile fish. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

The impacts under Alternative Island B would be similar to those described under Alternative Island A (the No Action Alternative), but transition to tidal marsh habitat would occur at a faster rate. The removed, lowered, and breached levees would reduce the total roosting habitat for pond-associated birds, but foraging habitat would improve with the creation of temporary mudflats and more complex and widespread channel networks. These changes are small compared to the amount of existing foraging habitat for pond-associated waterbirds in the South Bay and are unlikely to cause the populations of pond-associated waterbirds to decline 10 percent or greater relative to the NEPA/CEQA baseline. For these reasons, the impacts from Alternative Island B would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Additional breaches and levee modifications under Alternative Island C would result in the same transition processes as described in Alternatives Island A and Island B, but in more locations along Ponds A20 and A21. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The impacts and benefits for pond-associated waterbirds would be similar to those described for Alternative B. The removed, lowered, and breached levees would reduce the total roosting habitat for pond-associated birds, but foraging habitat would improve with the creation of temporary mudflats and more complex channel networks. These changes are small compared to the amount of existing foraging habitat for pond associated waterbirds in the South Bay and are unlikely to cause the populations of pond-associated waterbirds to decline 10 percent or greater relative to the NEPA/CEQA baseline. For these reasons, the impacts from Alternative Island C would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as unenhanced managed ponds. The outboard levees around Ponds A1 and A2W are high-priority levees for inland flood protection and would continue to be maintained for that purpose and for PG&E access. There would be no change to the operation and maintenance of Charleston Slough. Within a few years, the existing islands in A1 and A2W currently used as nesting habitat will degrade and no longer be suitable.

Under the No Action Alternative, there would be no change in impacts to pond-associated waterbirds.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to support the development of tidal marshes. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add more concrete to expand the footings around the bases of transmission towers. Habitat transition zones and nesting islands would also be constructed.

The reconstruction of the PG&E boardwalk through Pond A2W would have limited impacts because there is an existing boardwalk in this area. A new, short, section of boardwalk will be constructed but due to its location outside the ponds and its small area, it would not have a significant impact on pond-associated birds. Nesting and roosting habitat for pond-associated waterbirds would be increased through the construction of islands and habitat transition zones. Island features would be designed to provide breeding habitat for avocets, stilts, and terns, at least in the short term. As these constructed habitat features transition to tidal marsh, the usefulness of these islands for nesting birds may decrease. These islands have some potential to create concentration effects, where the large numbers of birds would become targets for predators such as gulls or disease. Gull management would be a part of ongoing Refuge and SBSP Restoration Project management and should help avoid displacement.

During the transition to the tidal marsh habitat, the ponds would provide foraging habitat in the form of mudflats and would enhance the local fisheries. Other than the islands, the long-term restored tidal marsh would offer minimal habitat for avocets, stilts, and terns, but some nesting opportunities may still be available on the surrounding levees, if isolated from terrestrial predators. Small amounts of mudflat foraging habitat outside of the ponds would be lost due to scour from the levee breaches, but improved foraging, in the short term, would be created inside the ponds as they transition to tidal marsh. These changes are small compared to the amount of habitat available for pond-associated waterbirds in the South Bay and are not expected reduce populations 10 percent or greater relative to the NEPA/CEQA baseline. As such, these impacts are considered less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would provide the same avocet, stilt, and tern habitat changes and impacts as described in Alternative Mountain View B, though Alternative C would transition Ponds A1 and A2W to tidal marsh more quickly. The same PG&E infrastructure improvements noted for Alternative B would also be made in Alternative C. In addition, Charleston Slough would be breached to the Bay and connected to Pond A1 to provide full tidal action to facilitate its transition to tidal marsh, as required by the City of Mountain View’s BCDC permit requirement. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park’s sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

The construction of the PG&E boardwalk would have little impact on pond-associated waterbirds as described for Alternative Mountain View B. The water intake structure improvements would have temporary effects to waterbirds that use Charleston Slough. Islands and habitat transition zones would be constructed as in Alternative B, but the habitat transition zone in Pond A2W would be smaller to allow connection to Mountain View Marsh and Stevens Creek Marsh. Like Alternative B, the nesting islands have potential to increase concentration effects; gull control would be a part of ongoing Refuge management and should help avoid displacement.

As the ponds and Charleston Slough evolve into tidal marsh, a transitional habitat of intertidal mudflats would offer short-term foraging habitat for avocets and stilts. The large areas of intertidal mudflat that provide foraging habitat for pond-associated waterbirds present at Charleston Slough would be converted to tidal marsh.

Alternative Mountain View C would add new public access features, including a long trail on the eastern side of Pond A2W’s levee and on the remaining levee along the outer (northern) side of Charleston Slough. These features may reduce the effectiveness of the habitat islands to be constructed within the ponds by bringing people nearer to them. These effects are discussed more fully in Impact 3.5-18. In general, however, research (e.g., Trulio et al. 2013) indicates that placing the islands several hundred feet away from trails or observation platforms (the exact distance varies by species) appears to minimize disturbance. Project designs and the choice of exact locations of the constructed islands would incorporate this guidance.

Overall, the foraging habitat for avocets, stilts, and terns, would be reduced with the conversion of the Mountain View Ponds, particularly at Charleston Slough, to tidal marsh, but new nesting and roosting habitat would be available on the constructed islands and habitat transition zones. The habitat changes are small compared to the amount of habitat available for pond-associated waterbirds in the South Bay and are not expected reduce populations 10 percent or greater relative to the NEPA/CEQA baseline. As such, these impacts are considered less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. These ponds are managed as muted tidal ponds that contain subtidal habitat of varying depths that provides foraging habitat for terns and other waterbirds. Surrounding levees are isolated from trails and could provide nesting habitat for avocets, stilts, and terns. The Refuge would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Phase 1 actions.

Under Alternative A8 A, there would be no impacts to pond-associated waterbirds.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, up to two habitat transition zones would be added to the interior of the ponds. The A8 Ponds would be managed and maintained in the same manner as described for the No Action Alternative. Though there would be a nominal decrease in the amount of subtidal forage habitat for water birds, the constructed habitat transition zones would provide increased potential roosting and nesting habitat. These changes are not expected to reduce the populations of pond-associated waterbirds 10 percent or greater relative to the NEPA/CEQA baseline. The overall changes in habitat would be minor under Alternative A8 B and are considered less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would continue to be maintained as seasonal ponds, with dry salt pannes in the summer and shallow ponding in the winter. Because outboard levees along Ponds R3 and R4 provide inland flood protection, they would be maintained or repaired as needed. Conditions would not change; therefore, there would be no impacts to avocets, stilts, and terns and their habitat at these ponds.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be opened to tidal action through a levee breach, and the inner pond levee between Ponds R3 and R4 would be improved. Water control structures would be built to allow Ponds R5 and S5 to be managed as enhanced managed pond habitat. Another water control structure would be added to Pond R3 at its border with Ravenswood Slough to improve control of water levels and thus forage quality along historic sloughs within that pond. A habitat transition zone would be added to Pond R4.

Each of these actions is intended to be beneficial to waterbirds and shorebirds. First, the introduction of tidal action would introduce mudflats that would provide foraging habitat for shorebirds. Over time, vegetation would grow on the mudflats as they transition to tidal marsh. Channels in the tidal marsh would continue to provide intertidal mudflat foraging habitat, especially with the breach planned at the historic slough to provide more dynamic tidal action. Second, the enhanced managed pond habitat in Ponds R5 and S5 would provide some potentially suitable foraging habitat for waterbirds. These additional features could improve waterbird and shorebird habitat overall. These changes are not expected to reduce the populations of pond-associated waterbirds 10 percent or greater relative to the NEPA/CEQA baseline. For these reasons, Alternative Ravenswood B would have a less-than-significant impact under CEQA and be beneficial under NEPA for pond-associated waterbirds.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Impacts for Alternative Ravenswood C are similar to Alternative Ravenswood B with the exception that Ponds R5 and S5 would be managed as intertidal mudflats and an additional habitat transition zone would be installed along the improved inner levee. Also, water control structures would be placed on Pond R3 to improve foraging quality along historic sloughs in Pond R3. A fence would also be installed along the southern edge of Pond R3 to limit disturbance by pedestrians and dogs. Shorebirds, including avocets, are expected to use intertidal mudflat habitat to forage on invertebrates and may also forage in Pond R3 depending on the control structure operation. Any changes caused by Alternative B are unlikely to reduce the populations of pond-associated waterbirds 10 percent or greater relative to the NEPA/CEQA baseline. The habitat transition zone would also provide additional nesting and roosting habitat. These actions would have less-than-significant impacts under CEQA and be beneficial under NEPA for pond-associated waterbirds.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Alternative Ravenswood D would provide features similar to those in Alternative Ravenswood B, the primary difference being that under Alternative D Ponds R5 and S5 would be fitted with water control structures and connected to the Bayfront Canal and Atherton Channel Project (of the City of Redwood City) to accept peak stormwater runoff from large winter storms and address residual salinity in Ponds R5 and S5. When not being used for such temporary stormwater detention, these ponds would be managed as enhanced pond habitat that could provide foraging habitat for shorebirds or other waterbirds. Like Alternative Ravenswood C, water control structures on Pond R3 would increase the foraging habitat within this pond. A fence would be installed along the southern edge of Pond R3 to decrease disturbance by humans and dogs. These actions are not expected to result in a decline in populations of pond-associated waterbirds by 10 percent or greater relative to the NEPA/CEQA baseline and would therefore have a less-than-significant impact under CEQA and be beneficial under NEPA for pond-associated waterbirds.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-5: Potential reduction in the numbers of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. The project-level impacts of the implementation of Phase 2 are assessed in this Final EIS/R.

Several species of waterbirds that may not otherwise occur in high numbers in the South Bay use the South Bay ponds in considerable numbers. These pond specialists, which include the eared grebe, Wilson's phalarope, red-necked phalarope, and Bonaparte's gull, are closely associated, at least on the scale of San Francisco Bay, with high-salinity ponds. High-salinity ponds generally support high invertebrate biomass, but low species diversity. Eared grebes, phalaropes, and Bonaparte's gulls use primarily moderate- to high-salinity ponds, where they forage on brine shrimp and brine flies (Harvey et al. 1992). Most individuals of all four of these species breed outside of the SBSP Restoration Project area and occur in the project area only during winter or during spring and fall migration (2007 EIS/R).

Eared grebes prefer ponds that are deep enough for them to forage in the underwater column. Phalaropes and Bonaparte's gulls are dabblers preferring shallow ponds. These migratory birds are present during summer and winter months and rely on the high-salinity ponds created for salt production. The restoration of high-salinity ponds into lower-salinity managed ponds and tidal marsh would affect these salt-pond-associated birds.

Within the Phase 2 pond clusters, high-salinity ponds are limited to the Ravenswood Ponds. The Island Ponds and A8 Ponds are tidally influenced, and therefore the salinity depends on the tide (variable between freshwater at 0 parts per thousand (ppt) salinity and ocean water at 32 ppt salinity). The Mountain View Ponds contain deep water year-round, and salinity is variable depending on rainfall (i.e., higher salinity in the summer when ponds are shallower and have reduced freshwater input) and very limited exchange with Bay water through siphons. These ponds never reach the high-salinity levels that are required for the mass production of brine flies. At the Ravenswood pond cluster, summer conditions provide dry salt flats, which convert to high-salinity shallow pools when it rains in the winter.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no changes to the current configuration of the Island Ponds would take place. They are currently open to tidal action and slowly transitioning to tidal marsh. No high-salinity pond habitat currently exists at the Island Ponds, and none would be created under this alternative. Actions under Alternative A would not impact salt-pond-associated birds.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, levee breaches in Pond A19, the removal of the levee between Ponds A19 and A20, and the lowering of the Pond A19 levees would be implemented to enhance connectivity and transition to tidal marsh. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. No high-salinity pond habitat currently exists at the Island Ponds, and none would be created under Alternative Island B. Actions under Alternative B would not impact salt-pond-associated birds.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Alternative Island C would be similar to Alternative Island B. In addition to those activities implemented under Alternative B, additional levee breaches on Ponds A20 and A21, pilot channel construction, and levee lowering at Pond A20 would be done to further enhance the connectivity of ponds and waterways as the ponds transition to tidal marsh under Alternative C. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. No high-salinity pond habitat currently exists at the Island Ponds, and none would be created under Alternative C. Actions under Alternative C would not impact salt-pond-associated birds.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as unenhanced managed ponds. Under the No Action Alternative, there would not be an impact on salt-pond-associated, high-salinity specialist birds.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to support the development of tidal marshes. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add more concrete to expand the footings around the bases of transmission towers.

Currently, there is only very limited use of the Mountain View ponds by phalaropes and somewhat higher use by eared grebes. There would be some reduction in foraging habitat of these species with the conversion to tidal marsh. Few of these birds use the Mountain View Ponds, and changes would be small both intrinsically and relative to habitat present elsewhere in the South Bay. These changes are not expected to reduce populations of non-breeding, salt-pond-associated birds by 50 percent. As such, the impacts of Alternative B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would involve breaching levees, as described in Alternative Mountain View B to increase the transition to tidal marsh habitat. The same PG&E infrastructure improvements noted for Alternative B would also be made in Alternative C. Under Alternative C, more levees would be breached so that Ponds A1 and A2W and Charleston Slough would also be breached to the Bay and connected to Pond A1 to provide full tidal action to facilitate transitions to tidal marsh, as required by the City of Mountain View's BCDC permit requirement. Islands and habitat transition zones would be constructed as in Alternative B, but the habitat transition zone in Pond A2W would be smaller to allow future connection to the Mountain View Mitigation Marsh and Stevens Creek Mitigation Marsh. Also, under Alternative C, the south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

Currently, there is only limited use of the Mountain View ponds by phalaropes and somewhat higher use by eared grebes. There would be some reduction in foraging habitat of these species with the conversion to tidal marsh. However, because few of these birds use the Mountain View ponds and changes would be small intrinsically and relative to habitat present elsewhere in the South Bay, populations are unlikely to decline by 50 percent below baseline levels. For these reasons, the impacts of Alternative C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no changes to the current configuration of the A8 Ponds would take place. These ponds are currently open to muted tidal action and some freshwater inputs when the armored notch is open. No high-salinity pond habitat currently exists at the A8 Ponds, and none would be created under Alternative A8 A. Actions under Alternative A8 A would not impact salt-pond-associated birds.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be construction in the southern corners of Pond A8S, but no other changes to the current configuration of the A8 Ponds would take place. They are currently open to tidal action and some freshwater inputs when the reversible armored notch is open. No high-salinity pond habitat currently exists at the A8 Ponds, and none would be created under Alternative A8 B. Actions under Alternative A8 B would not impact high-salinity specialist, salt-pond-associated birds.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would continue to be managed as shallow seasonal ponds with no direct connection to tidal influences. The high-salinity water in the borrow ditches and in the historic slough traces offers suitable salt-pond-associated, high-salinity habitat. During the winter, the shallow ponds provide foraging habitat for some salt-pond-associated species. The No Action Alternative would not impact salt-pond-associated, high salinity bird habitat.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be opened to tidal action and would become tidal marsh, and Ponds R5 and S5 would be enhanced managed ponds. High-salinity water channels in the historic slough of Pond R4 and shallow, high-salinity winter ponding in Ponds R5 and S5 would be lost. This loss could potentially impact foraging habitat for salt-pond-associated birds. Pond R3 would continue to be managed as a seasonal pond, with an added water control structure to control water levels, but one that would contain higher-salinity pools for foraging. Due to the abundance of high salinity ponds in other areas of the South Bay, it is expected that the small reduction in high salinity pond habitat resulting from Alternative Ravenswood B activities would not reduce populations by 50 percent below baseline levels and would therefore have a less-than-significant impact on salt-pond-associated birds.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R 4 would be opened to tidal action and would become tidal marsh, and Ponds R5 and S5 would become managed intertidal mudflats. High-salinity water channels in the historic slough of Pond R4 and shallow high-salinity, winter ponding would be lost. This loss could potentially impact foraging habitat for salt-pond-associated, high-salinity specialist birds. Pond R3 would continue to be managed as a seasonal pond, with water control structures to manage water, and would continue to contain higher-salinity pools for foraging. Due to the abundance of higher-salinity ponds in other areas of the South Bay, it is expected that the small reduction in high salinity pond habitat resulting from Alternative Ravenswood C activities would not reduce populations by 50 percent below baseline levels and therefore would have a less-than-significant impact on salt-pond-associated, high-salinity specialist birds.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be opened to tidal action and transition to tidal marsh habitat, and Ponds R5 and S5 would become enhanced managed ponds as described for Alternative Ravenswood B. The primary difference between Alternative D and Alternative B is that Ponds R5 and S5 would be fitted with water control structures and connected to the Bayfront Canal and Atherton Channel Project (of the City of Redwood City) to accept peak stormwater runoff from large winter storms. This increased freshwater input and associated pond draining would reduce the salinity in Ponds R5 and S5. Also, the high-salinity water channels in the historic slough of Pond R4 would be lost. This loss could potentially impact foraging habitat for salt-pond-associated, high-salinity specialist birds. Pond R3 would continue to be managed as a seasonal pond, with water control structures to manage water and would continue to contain higher-salinity channels for foraging. Due to the abundance of higher-salinity ponds in other areas of the South Bay, it is expected that the small reduction in salt pond habitat resulting from Alternative Ravenswood D would not reduce populations by 50 percent below baseline levels and therefore would have a less-than-significant impact for salt-pond-associated, high-salinity specialist birds.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-6: Potential reduction in foraging habitat for diving ducks, resulting in a substantial decline in flyway-level populations.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed. Diving ducks, such as lesser and greater scaup, bufflehead, canvasbacks, and other species, occur in the South Bay primarily during the nonbreeding season (note that ruddy ducks are addressed in Impact 3.5-7 of the Phase 2 impacts). These species forage in relatively shallow aquatic habitats in the South Bay, including shallow subtidal habitats, intertidal habitats (when flooded at high tide), and low-salinity managed ponds. These species have been shown to be negatively affected by decreases in water depth, low dissolved oxygen, and increased salinity (Scullen et al. 2015).

The SBSP Restoration Project could potentially affect the numbers of diving ducks in the South Bay in several ways. By converting ponds that currently provide foraging habitat for diving ducks to tidal habitats or enhanced managed ponds with a different hydrological regime (e.g., intertidal mudflats in Alternative Ravenswood C), the project would result in an overall loss of deeper, managed pond habitat. This conversion would be expected to adversely affect habitat for bufflehead, which occur in the South Bay primarily in managed ponds and make relatively little use of tidal waters. However, subtidal habitat in sloughs and larger channels within restored ponds would provide foraging habitat for species such as canvasbacks and scaup, potentially offsetting the effects of the loss of managed pond habitat (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh.

No pond habitat suitable for diving duck foraging currently exists at the Island Ponds, though they may temporarily provide some diving duck foraging habitat during high tides. Sloughs and channels would also form, offering limited foraging habitat within the vegetated tidal marsh. Although no action would be conducted, there would be changes over time to the baseline foraging habitat of diving ducks at the Island Ponds. Because there is so little existing forage habitat for diving ducks at the Island Ponds now, Phase 2 activities are unlikely to cause a population decline of 20 percent below baseline level or substantially reduce flyway-level populations. For these reasons, the changes under Alternative Island A would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, levee breaches on Pond A19, the removal of the levee between Ponds A19 and A20, and the lowering of the Pond A19 levees would be implemented to enhance habitat connectivity during and after the transition to tidal marsh. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The impacts and benefits of Alternative Island B would be similar to those described for Alternative Island A, though with a different spatial distribution in Pond A19 and Mud Slough. Because there is so little existing forage habitat for diving ducks in the Island Ponds now, Phase 2 activities are unlikely to cause a population decline of 20 percent below baseline level or substantially reduce flyway-level populations. Therefore, the changes under Alternative Island would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would be similar to Alternative Island B. In addition to those activities implemented under Alternative B, additional levee breaches on Ponds A20 and A21, pilot channel construction, and levee lowering at Pond A20 would be done to further enhance habitat connectivity during the transition to tidal marsh under Alternative C. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The impacts and benefits of Alternative C would be similar to those described for Alternative B but would also occur in Ponds A20 and A21. Because there is so little existing forage habitat for diving ducks in the Island Ponds now, Phase 2 activities are unlikely to cause a population decline of 20 percent below baseline level or substantially reduce flyway-level populations. For these reasons, the changes under Alternative Island C would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (No Action Alternative), no new action would be taken. Ponds A1 and A2W currently function as year-round ponds with suitable diving duck foraging and roosting habitat. These ponds would be maintained in their current condition and would continue to provide the same habitat functions. There would be no impacts to diving duck foraging habitat.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would restore Ponds A1 and A2W to tidal marsh by breaching the outer levees. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The conversion of Ponds A1 and A2W to tidal marsh would result in a long-term loss of the existing pond habitat, which currently provides foraging and roosting diving duck habitat. The sheltered, still-water habitat the ponds now provide to several hundred diving ducks per day in winter would be changed to tidal. Foraging habitat would remain for a decade or two while sediment accretes in these deeply subsided ponds. Some foraging habitat would permanently remain in the open water areas of Charleston Slough, Mountain View Slough, and Stevens Creek/Whisman Slough and slough channels created within the existing ponds. Temporary disturbance to diving duck foraging would occur during construction of the PG&E boardwalk through Pond A2W. Although some foraging habitat would be lost, substantial amounts of foraging habitat would still be available in the open waters of the Bay and in nearby managed ponds.

Implementation of ongoing monitoring and management actions would persist using the AMP. Examples of management changes that may be implemented in response to reductions in bird populations or the amounts of bird use of the ponds include social attraction to increase nesting, gull harassment, predator exclusion, recreational use of the nearby levees and ponds, or other habitat enhancements that have been shown to be effective.

Due to this availability of additional foraging habitat nearby and implementation of monitoring and adaptive management actions, these changes are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels. The impacts of Alternative Mountain View B on diving ducks would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, Ponds A1 and A2W would be restored to tidal marsh, as in Alternative Mountain View B, but it would also include additional levee breaches and the lowering of the levee connecting Pond A1 and Charleston Slough to connect these two water bodies. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C.

The habitat changes in Ponds A1 and A2W would generally be similar to those discussed above for Alternative Mountain View B. The increased connection with Charleston Slough would result in the conversion of mudflat habitat in that area to tidal marsh on a faster scale; however, water in Charleston Slough is rarely deep enough for diving ducks to use for foraging. Impacts from PG&E construction would be the same as in Alternative B and temporary in nature. Open water habitat for diving ducks is present elsewhere in the South Bay.

Implementation of ongoing monitoring and management actions would persist using the AMP. Examples of management changes that may be implemented in response to reductions in bird populations or the amounts of bird use of the ponds include social attraction to increase nesting, gull harassment, predator exclusion, recreational use of the nearby levees and ponds, or other habitat enhancements that have been shown to be effective.

Due to the availability of additional foraging habitat nearby and the implementation of monitoring and adaptive management actions, these changes are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels. The impact of Alternative Mountain View C on diving ducks would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. These ponds are currently open to muted tidal action through a pair of culverts and the armored notch, which was opened in 2011 as part of Phase 1 actions. The notch is opened seasonally and allows for some tidal and fluvial waters to enter the ponds, but due to restrictions in the size of the opened notch and the depth of these subsided ponds, not all the water leaves the ponds. The result is pond habitat suitable for foraging diving ducks. With time, this open water habitat will be lost as the ponds accrete sediment and begin to transition to tidal marsh. Open water habitat for diving ducks is present elsewhere in the South Bay. Due to the availability of additional foraging habitat nearby, these changes are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels. The impact of Alternative A8 A on diving ducks would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern corners of Pond A8S. The area of these habitat transition zones is very small relative to the size of the ponds themselves, and their placement would be on the southernmost corners, adjacent to the landfill access road and other activities. These are the least likely areas of the ponds to be used by diving ducks. Plentiful foraging habitat would remain within these ponds and be available in the open waters of the Bay and in nearby managed ponds. As under Alternative A8 A, this pond habitat would ultimately transition to tidal marsh. Due to the presence of diving duck foraging habitat in the South Bay, the reduction of foraging habitat as part of Alternative A8 B would not significantly reduce flyway-level populations or reduce populations 20 percent below baseline. Therefore, the impact of Alternative A8 B on diving ducks would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would continue to be managed as shallow seasonal ponds with no direct connection to tidal influences. No foraging habitat for diving ducks exists at the Ravenswood Ponds; therefore, this habitat would not be impacted.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would transition to tidal marsh habitat, and Ponds S5 and R5 would become enhanced managed ponds suitable for use by diving ducks.

The levee at Pond R4 would be breached at the historic slough to allow tidal flows in the pond, and water control structures would connect Ponds R5 and S5 to Pond R4 (and indirectly to the Bay) and Flood Slough. There would also be a water control structure to connect Pond R3 to Ravenswood Slough, though Pond R3 would remain managed as a seasonal pond.

These Ravenswood Ponds are dry throughout much of the year and only collect rainfall, which then evaporates or seeps into groundwater; they do not currently provide much quality habitat for diving ducks. Under Alternative B, Ponds R5 and S5 would be managed as subtidal ponds, which are deep enough to provide for diving duck foraging habitat. Also, diving ducks may be able to forage in the historic sloughs within Pond R4, if they are sufficiently deep.

The combined effect of these actions would be an increase in the area and availability of habitat for diving ducks in this portion of the Refuge, and these actions would be unlikely to cause a decline to 20 percent below the baseline level in population. Alternative Ravenswood B would have a less-than-significant impact under CEQA and be beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Alternative Ravenswood C offers similar components and resultant diving duck habitat as Alternative Ravenswood B, with the exception of the goal of the enhanced managed ponds at Ponds R5 and S5. Pond R4 would still transition to tidal marsh habitat, and Ponds S5 and R5 would be graded and managed to simulate intertidal mudflats. There would also be water control structures to connect Pond R3 to Ravenswood Slough and to Pond S5, though Pond R3 would remain managed as a seasonal pond.

Although Alternative Ravenswood C would not restore or provide as much habitat for diving ducks in Ponds R5 and S5 as Alternative Ravenswood B would, there could be some improvements in diving duck foraging habitat within the sloughs that would form in Pond R4. These changes would not be expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels. Overall, the impact of Alternative C on diving ducks and their habitat would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D offers similar components and resultant diving duck habitat as Alternative Ravenswood B. Pond R4 would transition to tidal marsh habitat, and Ponds S5 and R5 would become enhanced managed ponds. There would also be water control structures to connect Pond R3 to Ravenswood Slough and to Pond S5, as noted above. Most important, the City of Redwood City's Bayfront Canal and Atherton Channel Project would be hydraulically connected to the small triangular forebay of Pond S5 to allow diversion and temporary storage of stormwater and reduction of residual salinity in these small ponds. Due to the need to manage Ponds R5 and S5 for temporary storm water detention, the winter water levels in these ponds would generally be lower, with higher peaks during large storms. The salinity would also be reduced during these episodes.

Although Alternative Ravenswood D would not restore or provide as much habitat for diving ducks in Ponds R5 and S5 as Alternative Ravenswood B would, Ponds R5 and S5 would still function as managed ponds for much of the year, providing valuable foraging habitat for more of the year than they do now. Also, diving ducks may be able to forage in the historic sloughs within Ponds R3 and R4, if the sloughs are sufficiently deep and of the correct salinity. The combined effect of these actions would be an increase in the area of habitat for diving ducks in this portion of the Refuge. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels. Alternative D would have a less-than-significant impact under CEQA and be beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-7: Potential reduction in foraging habitat for ruddy ducks, resulting in a substantial decline in flyway-level populations.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Although small numbers of ruddy ducks breed in the South Bay, this species occurs in the project area primarily during their winter and migration. In contrast with most of the diving ducks addressed in Impact 3.5-6, ruddy ducks are diving ducks that, in the South Bay, forage primarily in ponds, with relatively few individuals using tidal habitats in the South Bay. Ruddy ducks were measured to account for 61 to 64 percent of the diving ducks in 46 South Bay ponds (Brand et al. 2014). Diving ducks generally are associated with low- to medium-salinity ponds (Ibid). Other studies (Takekawa et al. 2000) have reported that the South Bay ponds supported up to 27 percent of the Bay's total waterfowl population, including 67 percent of the ruddy ducks. These findings reinforce the information presented in the 2007 EIS/R, which stated that the majority of the ruddy ducks in the entire San Francisco Bay Area were in the South Bay ponds, with only 2 percent in open water tidal habitats in the South Bay.

Ruddy duck numbers were reported as 38,818, representing 10 per cent of all waterbirds in the San Francisco Bay estuary and 36 per cent of the Lower Pacific Flyway population. Of the total ruddy ducks counted, 77 per cent (29,892) were observed in the South Bay Ponds (Richmond et al. 2014). As such, substantial effects on the populations in the South Bay are likely to have a significant impact on the status of the flyway as a whole. The abundance of this species in the South Bay relative to the total flyway population increases the importance of potential effects from project activities.

Because ruddy ducks in the South Bay make little use of tidal waters, the SBSP Restoration Project would likely result in declines in ruddy duck numbers within the South Bay due to conversion of managed ponds to tidal habitats. Changes to existing pond habitat may affect ruddy duck populations by reducing available foraging habitat during a period of increased energetic stress following reproduction and molt (Tome 1984). Reductions in available forage may also increase density-dependent effects on fitness and increase the daily energy expenditure required to meet metabolic demand (Brand et al. 2014). As sedimentation fills the breached former ponds and suitable pond habitat gradually decreases, some additional energy expenditure would be required for ruddy ducks to move to additional areas. Disease, prey availability, and competitive interactions may increase as a result of reduced wintering habitat. However, despite the potential for decreased fitness, ruddy ducks have shown a strong ability to recover from weight losses associated with molting and laying (Thebault et al. 2008). That observation, in combination with the high levels of primary productivity in the South Bay pond area, mean that food sources are not likely the limiting factor on ruddy duck populations.

Some ruddy ducks displaced from South Bay ponds that are restored to tidal habitats would likely simply shift to other areas, including other managed ponds in the area of the SBSP Restoration Project, Cargill salt ponds, or ponds and lakes elsewhere in the South Bay. Others may be displaced from the South Bay entirely, but may shift to other Bay Area locations or use other central California locations during migration and winter. Unpublished data from the Eden Landing pond complex support this assertion. Pond E9 was breached in September or 2009, converting what had been deep-water pond habitat to tidal lagoons and mudflats. Winter bird counts in that area before and after the levee breach indicate that a spatial redistribution of the ruddy duck population occurred but that a large overall decline did not. Ruddy duck numbers in Pond E9 declined over 95 per cent between 2011 and 2014. However, the adjacent ponds, E2, E4, E6A E6E, E7, E8, E8X, and E10 all saw large increases in ruddy duck numbers. In total, ruddy duck numbers for the Eden Landing pond complex decreased approximately 16 percent after the breach of Pond E9 (C. Strong, pers. comm. 2015).

This decrease in ruddy duck counts is not necessarily evidence of a negative trend in ruddy duck populations in the San Francisco Bay or the Pacific Flyway. Trend analysis of midwinter waterfowl survey results between 1981 and 2012 suggests that ruddy duck numbers in the San Francisco Estuary have been stable over that period even while demonstrating large interannual variability. The scale of the displacement caused by the loss of suitable habitat in Pond E9 is significantly less than the annual variation around the San Francisco Bay. These populations, numbering 38,818 in 2012, shift by many thousands of individuals counted on an annual basis compared to a change of approximately 100 fewer individuals counted within the Eden Landing Pond Complex (Richmond et al. 2014). However, given the importance of San Francisco Bay to Pacific Flyway numbers of ruddy ducks and the relatively high percentage of Bay Area ruddy ducks that occur in South Bay ponds, a decline in the extent of salt ponds in the South Bay may result in flyway-level declines in ruddy duck numbers (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP.

Currently, a small number of ruddy ducks use the Island Ponds and adjacent sloughs for foraging. As the ponds transition to tidal marsh, they are expected to be used less, though some foraging habitat would still be available within the channels inside the marsh. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Compared to the habitat present for ruddy ducks in the South Bay, the changes to habitat would be small and less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, levee breaches on Pond A19, the removal of the levee between Ponds A19 and A20, and the lowering of Pond A19 levees would be implemented to enhance habitat connectivity as the ponds continue to transition to tidal marsh. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. A small amount of habitat currently being used by ruddy ducks would be lost, as described in Alternative Island A. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Compared to the habitat present for ruddy ducks in the South Bay, the changes to habitat would be small and less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would be similar to Alternative Island B. In addition to those activities implemented under Alternative B, additional levee breaches on Ponds A20 and A21, pilot channel construction, and levee lowering at Pond A20 would be done to further enhance habitat connectivity as the ponds continue to transition to tidal marsh. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. A small amount of habitat currently being used by ruddy ducks would be lost, as described in Alternative Island A. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Compared to the habitat present for ruddy ducks in the South Bay, the changes to habitat would be small and less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. Ponds A1 and A2W currently function as year-round ponds with suitable ruddy duck foraging habitat. These ponds would be maintained in their current condition and would continue to provide the same habitat functions. There would be no impacts to ruddy duck foraging habitat.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would restore Ponds A1 and A2W to tidal marsh by breaching the outer levees. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of transmission towers.

The conversion to tidal marsh would result in a loss of existing pond habitat that currently provides foraging and roosting ruddy duck habitat. Seasonal permitted hunting in Refuge ponds near the Mountain View Ponds may make the availability of these ponds to ruddy ducks more important. Construction of the PG&E boardwalk could result in temporary disturbance. After restoration, some foraging habitat would remain in the open water areas of the former ponds, Charleston Slough and Mountain View Slough, though these sloughs are smaller and shallower than Ponds A1 and A2W. Foraging habitat for ruddy ducks is also available in nearby managed ponds and elsewhere in the South Bay. The project would not impact breeding habitat.

The ruddy duck is a stable species in the South Bay (Richmond et al. 2014). The threshold for a significant impact to ruddy ducks is a 15 percent decline in population. Given the wide availability of other ponds in the South Bay the conversion of these ponds to marsh would not cause a 15 percent population decline. With the availability of foraging habitat nearby and no impacts to breeding or nesting habitat, Alternative Mountain View B is expected to have a less-than-significant impact on the ruddy duck population.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, additional breaches would be made, and the levee between Pond A1 and Charleston Slough would be lowered to enhance connectivity and incorporate Charleston Slough in the transition to tidal marsh. The south and west levees of Charleston

Slough will be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added at the levee breach location between Pond A1 and Charleston Slough. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made for Alternative Mountain View C.

Alternative Mountain View C results in similar habitat losses and temporary construction disturbances as those described for Alternative Mountain View B because deep-water foraging habitat would be lost in Ponds A1 and A2, but would also include Charleston Slough. This slough, which currently provides intertidal mudflat habitat, does not currently serve as foraging habitat for ruddy ducks, so its inclusion would not contribute to additional impacts. Foraging habitat for ruddy ducks is also available in nearby managed ponds. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. With the availability of foraging habitat nearby and no impacts to breeding or nesting habitat, Alternative Mountain View C is expected to have a less-than-significant impact on the ruddy duck population.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no action would take place. These ponds are currently open to muted tidal action through a pair of culverts and the armored notch, which was opened in 2011 as part of Phase 1 actions. The notch is opened seasonally and allows for some tidal and fluvial waters to enter the ponds, but due to restrictions in the size of the opened notch and the depth of these subsided ponds, not all the water leaves the ponds. The result is seasonally muted tidal pond habitat suitable for foraging ruddy ducks. With time, this open water habitat would be lost as the pond transitions to tidal marsh. However, open water habitat for ruddy ducks is present elsewhere in the South Bay. Due to the availability of additional foraging habitat nearby, and because Alternative A8 A proposes no short-term changes to the habitat or management in the A8 Ponds, neither substantial declines in flyway-level populations nor a 15 percent reduction in population are expected. For these reasons, the impacts of Alternative A8 A on ruddy ducks would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern corners of Pond A8S. The total area of lost foraging habitat would be very small in absolute terms and relative to the rest of the pond and nearby managed ponds. As under Alternative A8 A, this pond habitat would ultimately transition to tidal marsh. Due to the presence of other ruddy duck foraging habitat in the South Bay, the reduction of foraging habitat as part of Alternative A8 B would be unlikely to cause either substantial declines in flyway-level populations or a 15 percent reduction in population. As such, impacts to ruddy ducks would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would continue to be managed as shallow seasonal ponds with no direct connection to tidal influences. Because this alternative would result in no changes, there would be no impact to ruddy ducks under the No Action Alternative.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would transition to tidal marsh habitat and Ponds S5 and R5 would become enhanced managed ponds. The levee at Pond R4 would be breached at the historic slough to allow tidal flows in the pond, and water control structures would connect Ponds R5 and S5 to Pond R4 (and indirectly to the Bay) and Flood Slough. An additional water control structure would connect Pond R3 to Ravenswood Slough, though Pond R3 would remain managed as a seasonal pond.

These Ravenswood Ponds are dry throughout much of the year and only collect rainfall, which then evaporates or seeps into groundwater; they do not currently provide much quality habitat for ruddy ducks, and are minimally used. Under Alternative Ravenswood B, Ponds R5 and S5 would be managed as subtidal ponds that are deep enough to provide for ruddy duck foraging habitat. Also, ruddy ducks may be able to forage in the historic sloughs within Pond R4, if the sloughs are sufficiently deep. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Overall, Alternative Ravenswood B would have a less-than-significant impact on ruddy ducks under CEQA and be beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Alternative Ravenswood C offers similar components and resultant ruddy duck habitat as Alternative Ravenswood B, with the exception of the goal of the enhanced managed ponds at Ponds R5 and S5. Pond R4 would still transition to tidal marsh habitat, but Ponds S5 and R5 would be graded and managed to simulate intertidal mudflats. There would also water control structures to connect Pond R3 to Pond S5, though Pond R3 would remain managed as a seasonal pond.

Although Alternative Ravenswood C would not restore or provide as much habitat for ruddy ducks in Ponds R5 and S5 as Alternative Ravenswood B would, there could be some improvements in ruddy duck foraging habitat within the sloughs that would form in Ponds R3 and R4, if the sloughs are sufficiently deep and of low enough salinity. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Overall, the impacts on diving ruddy ducks and their habitat would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D offers similar components and resultant ruddy duck habitat as Alternative Ravenswood B. Pond R4 would transition to tidal marsh habitat, and Ponds R5 and S5 would become enhanced managed ponds. There would also be water control structures to connect Pond R3 to Ravenswood Slough and to Pond S5, as noted above. Most important, the City of Redwood City's Bayfront Canal and Atherton Channel Project would be hydrologically connected to the small triangular forebay of Pond S5 to allow diversion and temporary storage of stormwater. Due to the need to manage Ponds R5 and S5 for temporary stormwater detention, the winter water levels in these ponds would generally be lower than in the rest of the year, with higher peak-water levels during large storms. The salinity would also be reduced during these episodes.

Although Alternative Ravenswood D would not restore or provide as much habitat for ruddy ducks in Ponds R5 and S5 as Alternative Ravenswood B would, Alternative D would provide more than Alternative Ravenswood C. Ponds R5 and S5 would still function as managed ponds for much of the year, providing valuable foraging habitat. Also, ruddy ducks may be able to forage in the historic sloughs within Pond R4, if the sloughs are sufficiently deep. The combined effect of these actions would be an increase in the area of habitat for ruddy ducks in this portion of the Refuge. Alternative D would not cause substantial declines in flyway-level populations or cause a 15 percent reduction in population and would therefore be a less-than-significant impact under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-8: Potential habitat conversion impacts on California least terns.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

California least terns are classified as both a federally and a state endangered species. No critical habitat has been proposed or designated for California least terns; therefore, none would be adversely modified by the project. California least terns have bred in the vicinity of the SBSP Restoration Project area in small numbers in the past, but now occur in the South Bay primarily as post-breeding dispersants. Most California least terns in the San Francisco Bay Area currently nest in Alameda County, and most foraging during the breeding season (e.g., to feed chicks) occurs outside the Phase 2 pond areas. This species currently uses the South Bay primarily as a post-breeding staging area in late summer. Former salt ponds are used for both foraging (in lower-salinity ponds supporting fish) and roosting (on levees, islands, and artificial structures such as boardwalks). Although large foraging concentrations are noted in salt ponds, this species frequently forages on the Bay and in channels as well (2007 EIS/R).

Foraging habitat for California least terns in deep managed ponds is expected to decline under alternatives where those deep managed ponds are converted to tidal or seasonal habitats. However, tidal restoration is expected to benefit prey fish populations for the California least tern, and miles of sloughs and channels that would provide foraging habitat for this species are proposed to be restored by the project. California least terns “displaced” from current South Bay foraging locations would likely find alternative foraging areas, either within the project area, the larger South Bay, or elsewhere in the Bay Area. The degree to which a reduction in foraging habitat in ponds would be offset by increases in habitat and prey abundance in the Bay and in restored sloughs and whether the SBSP Restoration Project would have considerable impacts on the species at all are unknown (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. The existing habitat and future vegetated tidal marsh habitat at the Island Ponds provide minimal foraging and roosting habitat for the California least tern. Foraging habitat may improve over time as tidal channels and tidal marsh form, providing higher-quality fish nurseries. Overall, Alternative Island A would have no impact on the California least tern or its habitat.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, levee breaches on Pond A19, the removal of the levee between Ponds A19 and A20, and the lowering of the Pond A19 levees would be implemented to enhance habitat connectivity as the ponds transition to tidal marsh. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Like Alternative Island A, the existing habitat and future vegetated tidal marsh habitat at the Island Ponds would provide minimal foraging and roosting habitat for the California least tern. The benefits of tidal marsh would still occur, but in somewhat different locations. Overall, Alternative Island B would have no impact on the California least tern or its habitat.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Alternative Island C would be similar to Alternative Island B. In addition to those activities implemented under Alternative B, additional levee breaches on Ponds A20 and A21, pilot channel construction, and levee lowering at Pond A20 would be done to further enhance habitat connectivity as the ponds transition to tidal marsh under Alternative C. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Like Alternatives Island A and Island B, the existing habitat and future vegetated tidal marsh habitat at the Island Ponds would provide minimal foraging and roosting habitat for the California least tern. The benefits of tidal marsh would still occur, but in more and different locations. Overall, Alternative Island C would have no impact on the California least tern or its habitat.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. Levees would be maintained and the ponds would continue to function as deep managed ponds. The currently deep water in Ponds A1 and A2W would continue to provide foraging habitat. Levees and islands within the Mountain View Ponds would continue to provide roosting habitat. The No Action Alternative would have no significant impact on the California least tern or its habitat.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. In Alternative Mountain View B, Ponds A1 and A2W would be restored to tidal marsh by breaching the levee. PG&E infrastructure improvements would involve adding a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raising and improving the existing boardwalk within Pond A2W, and adding more concrete to the footings around the bases of transmission towers. Constructed islands and habitat transition zones would be included in the restoration.

Currently, California least terns forage in the Mountain View Ponds. After breaching, terns would most likely continue to use these areas and adjacent open water for foraging. The islands and remaining levees would also provide opportunities for roosting and nesting habitat. There could be temporary disturbance to California least tern roosting habitat during levee modifications, but the construction of habitat islands would result in a small net change in the amount of roosting habitat while increasing the quality of that habitat. Deep-water foraging within Ponds A1 and A2W would be lost, but over time the tidal marsh would develop into fish nursery habitat that could improve deep-water foraging in the adjacent sloughs and the channels that form within the ponds. Temporary impacts to foraging and roosting habitat through disturbance could also occur during construction of the PG&E boardwalk and tower foundations. Impacts to the California least tern associated with the loss of foraging habitat in Ponds A1 and A2W would be partially offset through improved foraging in adjacent sloughs and the creation of roosting islands in the ponds. Therefore, Alternative Mountain View B would not be expected to impact California least tern or its habitat enough to contribute to a population decline. Due to these improvements and the availability of adjacent open bay foraging habitat, impacts to the California least tern would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, additional breaches would be made, and the levee between Pond A1 and Charleston Slough would be lowered to connect these two water bodies as they transition to tidal marsh. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made for Alternative C.

Alternative Mountain View C would provide similar California least tern habitat features as described in Alternative Mountain View B. Due to the improvements provided by improved fisheries, creation of nesting islands, and presence of nearby deep-water habitat that would provide improved foraging, as described for Alternative B, impacts to California least tern would be less than significant under Alternative C.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. The ponds would continue to be managed as muted tidal ponds that currently provide suitable foraging habitat for the California least tern. Over the very long term, these muted tidal ponds are expected to accrete sufficient sediment to begin transitioning to tidal marsh, which would be a reduction in the quantity of least tern foraging habitat, but would provide an increase in foraging quality by providing additional fisheries nursery habitat. The No Action Alternative at the A8 Ponds would have a less-than-significant impact on the California least tern.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern corners of Pond A8S. Because the combined area of these habitat transition zones is not large in absolute terms or relative to the total area of the ponds, the resulting configuration would still provide adequate foraging habitat in the short term. Also, the surrounding levees and additional habitat transition zones would provide short-term roosting habitat that could benefit California least terns. In the long term, as in Alternative A8 A, these ponds would accrete sediment, reach marsh plain elevation, and begin growing marsh vegetation, which would reduce least tern foraging habitat within the pond and potential roosting habitat in the habitat transition zones. However, this long-term transition would also provide an increase in foraging quality by providing additional fisheries nursery habitat. Due to the availability of foraging habitat nearby and improved fish habitat quality, the impact of Alternative A8 B on the California least tern would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds, with dry salt pannes in the summer and shallow ponding in the winter. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action and Bay connectivity. Under the No Action Alternative, there would be no impacts to the California least tern.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached to allow transition to tidal marsh habitat, and Ponds R5 and S5 would become managed subtidal ponds. A habitat transition zone and an improved inner levee would be added to Pond R4. There would also be a water control structure to connect Pond R3 to Ravenswood Slough, though Pond R3 would be continue to be managed as a dry salt panne.

Currently, the Ravenswood Ponds do not provide foraging habitat for the California least tern. Potential roosting habitat exists on levees, but is not used in these areas. Under Alternative Ravenswood B, some roosting habitat would be lost as levees are breached and Pond R4 is converted to tidal marsh habitat. However, these losses would not be significant because the habitat is not being used.

Overall, the Alternative Ravenswood B actions would be beneficial to the California least tern because they would improve foraging habitat. The introduction of tidal action in Pond R4 would provide additional slough habitat for foraging. As the tidal marsh develops, improved fisheries could increase the foraging quality within sloughs and channels in Pond R4 and also outside of this pond. Also, Ponds R5 and S5, functioning as enhanced managed ponds, may provide some potential foraging habitat for least terns. Under Alternative B, there would be no impact under CEQA because no California least terns currently utilize this habitat and actions would be beneficial under NEPA.

Alternative Ravenswood B Level of Significance: No Impact (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would still transition to tidal marsh habitat, but Ponds R5 and S5 would become managed intertidal mudflats. There would also be water control structures to connect Pond R3 to Ravenswood Slough and to Pond S5.

The tidal sloughs and fisheries habitat improvements described for Alternative Ravenswood B would also apply under Alternative Ravenswood C, and the same types of beneficial habitat improvements would result, but the benefit of increased foraging habitat in Ponds R5 and S5 would be somewhat less under Alternative Ravenswood C than in Alternative Ravenswood B. The loss of potential roosting habitat in Pond R4 and on the levees would be the same, as these areas are not being used. Under Alternative Ravenswood C, there would be no impact under CEQA because no California least terns currently utilize this habitat and actions would be beneficial under NEPA.

Alternative Ravenswood C Level of Significance: No Impact (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would transition to tidal marsh habitat, and Ponds R5 and S5 would become enhanced managed ponds. There would also be water control structures to connect Pond R3 to Ravenswood Slough and to Pond S5. Most important, the City of

Redwood City's Bayfront Canal and Atherton Channel Project would be hydraulically connected to the small triangular forebay of Pond S5 to allow diversion and temporary storage of stormwater. Due to the need to manage Ponds R5 and S5 for temporary stormwater detention, the winter water levels in these ponds would generally be lower, with higher peaks during large storms. The salinity would also be reduced during these episodes.

Alternative Ravenswood D provides similar benefits as Alternative Ravenswood B. Under Alternative D, there would be no impact under CEQA because no California least terns currently utilize this habitat and actions would be beneficial under NEPA.

Alternative Ravenswood D Level of Significance: No Impact (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-9: Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew and further isolation of these species' populations due to breaching activities and scour.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Tidal restoration would require direct alteration of habitats (e.g., levee breaching, levee lowering, and installation of water-control structures) that would affect levees and small amounts of tidal marsh, generally on the outboard side of the ponds. Also, tidal marsh restoration would re-create larger tidal prisms within existing channels, which would be expected to result in an increased level of erosion of existing tidal marshes and scour of the existing channels. However, in the long term, there would be an overwhelmingly positive benefit to tidal marsh-associated species from tidal restoration, as thousands of acres of new marsh would be created, albeit over an extended period. However, there is very little pickleweed-dominated tidal salt marsh in the area of the SBSP Restoration Project, and the existing narrow corridors of habitat between larger blocks of habitat are necessary for dispersal of mice and shrews among core habitat areas. Therefore, even the limited habitat present in these corridors has high value as dispersal habitat (2007 EIS/R).

Because tidal restoration efforts are being phased, new pickleweed-dominated habitat is expected to form from early phases of restoration before later breaching actions and associated scour occur elsewhere in the Refuge. In the long term, tidal restoration is expected to result in substantial increases in habitat connectivity through marsh establishment. The 2007 EIS/R concluded that these sorts of project benefits would occur before short-term reductions in dispersal capability have substantial effects on populations in core habitat areas (2007 EIS/R). The early results of Phase 1 and ISP activities are supporting this general assertion.

For pickleweed marsh-associated species such as the salt marsh harvest mouse and salt marsh wandering shrew, the SBSP Restoration Project is expected to result in considerable increases in habitat in the long term, thereby augmenting populations far beyond the minor, local impacts that would occur during some construction activities. Monitoring of salt marsh harvest mouse habitat and numbers would occur as part of the AMP to monitor the success of the SBSP Restoration Project with respect to these species (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP.

Small losses of pickleweed-dominated tidal marsh may occur at ponds where uncontrolled breaching occurs, due to erosion and scour. Because such breaches would be unintentional, the locations and extent of habitat loss would not be controlled at all, and thus salt marsh harvest mouse and wandering shrew dispersal in any given area may be adversely affected in the short term. However, in the long term, uncontrolled breaching of levees would ultimately result in increases in tidal marsh habitat, a beneficial effect for tidal marsh-associated wildlife. This increase in habitat would offset any minor short-term impacts to pickleweed-dominated tidal marsh and the dispersal or habitat of marsh-associated species.

Under the No Action Alternative, the salt marsh harvest mouse and salt marsh wandering shrew are expected to benefit from the increase in tidal habitat that would occur due to the natural transition to tidal marsh habitat at the Island Ponds. The impact to the salt marsh harvest mouse and salt marsh wandering shrew would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, actions would be taken to increase the habitat connectivity and complexity as the Island Ponds transition to tidal marsh. The Pond A19 levee would be breached along Mud Slough and lowered in various places. The levees between Ponds A19 and A20 would be removed. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The removal of levees through breaching, lowering, and full removal would result in temporary losses to the narrow bands of pickleweed marsh habitat that exist along the outside of these levees. However, it is expected that, in the long term, these actions would result in an overall increase in tidal marsh habitat containing pickleweed-dominated habitat.

Under Alternative Island B, the salt marsh harvest mouse and salt marsh wandering shrew are expected to benefit from the increase in tidal habitat that would occur due to the natural transition to tidal marsh habitat at the Island Ponds. The impact to the salt marsh harvest mouse and salt marsh wandering shrew would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. In addition to the actions listed under Alternative Island B, Alternative Island C offers additional actions to further enhance the habitat connectivity and complexity as all three Island Ponds transition to tidal marsh. The actions would include widening and adding breaches and excavating pilot channels cut into the marsh to further facilitate sediment accretion and marsh development. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The removal of levees through breaching, lowering, and full removal would result in temporary losses to the narrow bands of pickleweed marsh habitat that exist along these levees. In the long term, the actions in Alternative Island C would result in a large overall increase in tidal marsh habitat containing pickleweed-dominated habitat.

Under Alternative Island C, the salt marsh harvest mouse and salt marsh wandering shrew are expected to benefit from the increase in tidal habitat that would occur due to the natural transition to tidal marsh habitat at the Island Ponds. The impact to the salt marsh harvest mouse and salt marsh wandering shrew would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds, and Charleston Slough would remain the muted tidal mudflat that it is. The outboard levees around Ponds A1 and A2W are high-priority levees to be maintained for inland flood protection.

Under the No Action Alternative, the Mountain View Ponds would be maintained in their current condition; therefore, this alternative would have no impact on pickleweed-dominated tidal salt marsh habitat or dependent species.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to transition from pond to tidal marsh habitat. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1’s bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The PG&E infrastructure and levee improvements within the ponds would not affect pickleweed habitat. The addition of the new boardwalk section north of Pond A1 would be in an area that is a mixture of marshes and mudflats; there could be some lost pickleweed habitat there. All PG&E boardwalks would include anti-predator gates to reduce the chance of terrestrial predators using the boardwalk to access marsh areas and attempt to prey on marsh species. Also, the new length of boardwalk would provide some potential new perching habitat for raptors that may prey on salt marsh harvest mice; however, no new towers or power lines would be added. The new section of boardwalk and the improvements to existing boardwalk will necessitate additional PG&E Section 7 consultation under the federal Endangered Species Act.

Narrow corridors of pickleweed habitat would be lost when levees are breached to connect to the channels outside the ponds. The habitat losses at breaching points would be a short-term impact to pickleweed habitat. In the long-term, the breaches are expected to result in the creation of large extents of diverse tidal marsh habitat. A diverse tidal marsh habitat would be interspersed with pickleweed, offering increased habitat and dispersal corridors for the salt marsh harvest mouse and the salt marsh wandering shrew.

Overall, Alternative Mountain View B would increase the total area of pickleweed-dominated tidal marsh habitat in the long term. Any losses would be temporary and would be more than offset by the restoration of tidal marsh habitat in Ponds A1 and A2W. The impact to the salt marsh harvest mouse and salt marsh wandering shrew would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Under Alternative Mountain View C, additional breaches would be made, and the levee between Pond A1 and Charleston Slough would be lowered to connect these two waterbodies. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements and associated effects noted for Alternative Mountain View B would also be made for Alternative C.

Alternative Mountain View C includes restoration of tidal marsh habitat in Charleston Slough and proposes several more breaches than the number proposed under Alternative Mountain View B. The additional breaches would impact more existing pickleweed habitat corridors. Similar to Alternative Mountain View B, though, these impacts would be temporary. Further restoration of tidal marsh habitat in Charleston Slough would result in more pickleweed-dominated marsh habitat than offered in Alternative Mountain View B.

Therefore, Alternative Mountain View C would increase the total area of pickleweed-dominated tidal marsh habitat in the long term. Any losses would be temporary and would be more than offset by the restoration of tidal marsh habitat in Ponds A1 and A2W and Charleston Slough. The impact to the salt marsh harvest mouse and salt marsh wandering shrew would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Phase 1 actions. The A8 Ponds are managed as subtidal ponds with muted tidal action. During the summer months they are managed as deep-water habitat and during the wet season water levels may be drawn down so as to provide flood storage capacity for the Lower Guadalupe River Project.

Under the No Action Alternative, the A8 Ponds would be managed and maintained in their current condition. Therefore, there would be no change in impacts to pickleweed-dominated tidal salt marsh habitat.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern corners of Pond A8S. Under Alternative A8 B, the A8 Ponds would be managed and maintained in the same manner as described for the No Action Alternative. Potential short-term losses of pickleweed habitat could occur during the installation of the habitat transition zone if this habitat type exists where the habitat transition zone would be installed. However, in general the pond edges are very steep, so there is not much space for pickleweed-dominated marsh to grow. Also, the temporary losses would be offset by the construction of more gently sloped habitat transition zones, which would greatly increase the space for new pickleweed habitat to form in the habitat transition zones. The habitat transition zones would be designed with a gradual slope to encourage the development of diverse tidal marsh habitats that would include an elevation range suitable for pickleweed-dominated tidal salt marsh habitat.

Overall, the impact of the temporary losses of pickleweed habitat would be less than significant, and the addition of new pickleweed habitat on the habitat transition zones would be beneficial under NEPA.

Alternative A8 B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action and Bay connectivity. Narrow corridors of pickleweed habitat exist on the outboard side of the Ravenswood Ponds and in a small portion of Pond S5.

Under the No Action Alternative, there would be no impact to pickleweed-dominated tidal salt marsh habitat.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be converted to tidal marsh by breaching the eastern levee and lowering a portion of the northwestern levee. There would also be construction of a habitat transition zone along one edge. Ponds R5 and S5 would be enhanced managed ponds; the installation of water control structures would allow the water levels of the ponds to be managed. Pond R3 would be enhanced with a water control structure for better control of water levels and forage quality in its slough traces and borrow ditches.

Impacts to pickleweed-dominated habitat would be caused by the breaching and lowering of the outboard levees of Pond R4 and to a lesser extent in the western section of Pond S5 and eastern section of R3, where the water control structures would be placed. Also in Pond S5, existing pickleweed habitat would be flooded as the area transitions to managed pond habitat. These impacts would be more than offset by the restoration of tidal marsh in Pond R4. The Ravenswood Ponds are adjacent to large pickleweed marshes, and their elevation is appropriate for marsh formation; therefore, pickleweed habitat is expected to quickly colonize and develop along restored tidal sloughs and habitat transition zones in the restored marsh.

Overall, Alternative Ravenswood B would increase pickleweed-dominated tidal marsh habitat in the long run. Any losses of this vegetation type would be temporary and would be more than offset by the restoration of tidal marsh habitat in Pond R4. Restored tidal marsh habitat in Pond R4 would offer increased habitat and dispersal corridors for the salt marsh harvest mouse and salt marsh wandering shrew. The impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be converted to tidal marsh by breaching the eastern levee and lowering a portion of the northwestern levee. A habitat transition zone would also be constructed along one edge. Ponds R5 and S5 would be enhanced to simulate intertidal mudflats. The installation of water control structures in R5 and S5 would allow the ponds to be operated to replicate daily tidal cycles. Pond R3 would be enhanced with two water control structures for better control of water levels and forage quality in its slough traces and borrow ditches.

Impacts to pickleweed-dominated habitat would be caused by the breaching and lowering of the outboard levees of Pond R4 and to a lesser extent in the western section of Pond S5 and the eastern section of Pond R3, where the water control structure would be placed. Also in Pond S5, existing pickleweed habitat would be regularly flooded as the area transitions to mudflat. These impacts would be more than offset by the restoration of tidal marsh in Pond R4. The Ravenswood Ponds are adjacent to large pickleweed marshes and their elevation is appropriate for marsh formation; therefore, pickleweed habitat is expected to quickly colonize and develop along restored tidal sloughs and habitat transition zones in the restored marsh.

Overall, Alternative Ravenswood C would increase pickleweed-dominated tidal marsh habitat in the long run. Any losses of this vegetation type would be temporary and would be more than offset by the restoration of tidal marsh habitat in Pond R4. Restored tidal marsh habitat in Pond R4 would offer increased habitat and dispersal corridors for the salt marsh harvest mouse and salt marsh wandering shrew. The impact of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA), Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be converted to tidal marsh by breaching the eastern levee and lowering a portion of the northwestern levee. Habitat transition zones would also be constructed along two interior edges of the pond. Ponds R5 and S5 would be enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows and address residual salinity in Ponds R5 and S5. Pond R3 would be enhanced as described in Alternative Ravenswood C.

Impacts to pickleweed-dominated habitat would be caused by the breaching and lowering of the outboard levees of Pond R4 and to a lesser extent in the western section of Pond S5, where the water control structure would be replaced. Also in Pond S5, existing pickleweed habitat would be flooded as the area transitions to managed pond habitat and stormwater detention basin. These impacts would be more than offset by the restoration of tidal marsh in Pond R4. The Ravenswood Ponds are adjacent to large pickleweed marshes and their elevation is appropriate for marsh formation; therefore, pickleweed habitat is expected to quickly colonize and develop along restored tidal sloughs and habitat transition zones in the restored marsh.

Overall, Alternative Ravenswood D would increase pickleweed-dominated tidal marsh habitat in the long run. Any losses of this vegetation type would be temporary and would be more than offset by the restoration of tidal marsh habitat in Pond R4. Restored tidal marsh habitat in Pond R4 would offer increased habitat and dispersal corridors for the salt marsh harvest mouse and salt marsh wandering shrew. The impact of Alternative D would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA), Beneficial (NEPA)

Phase 2 Impact 3.5-10: Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Construction related to the implementation of the SBSP Restoration Project could potentially disturb some special-status wildlife species, and in some cases could lead to the loss of individuals. Wildlife species that occur in tidal marsh habitats in the project area include special-status species such as the salt marsh harvest mouse, salt marsh wandering shrew, California Ridgway's rail, saltmarsh common yellowthroat, Alameda song sparrow, and northern harrier (2007 EIS/R).

Tidal restoration would require direct alteration of habitats (e.g., levee breaching and installation of water control structures) that would affect levees and small amounts of tidal marsh. Such activities could potentially result in direct injury or mortality to marsh-associated species and their nests, eggs, and young, though such direct effects are expected to be minor due to the limited nature of direct impacts. Also, restoration activities associated with both tidal restoration and enhancement of managed ponds (e.g., grading, island and berm construction, water-control structure installation and maintenance) would involve the movement of heavy equipment, loud noise, and human presence in and adjacent to existing marsh habitats. These activities may result in the disturbance of wildlife within those habitats, possibly causing individuals to flee areas adjacent to construction activities or abandon their nests or territories in these areas. Such occurrences would be short-term adverse effects. It is anticipated that a number of measures to avoid and minimize impacts to federally listed species, such as seasonal work windows and biological monitoring as described below, would be required by the BO for this project (2007 EIS/R).

Seasonal work windows and biological monitoring may be used to avoid and minimize construction-related impacts to special-status, marsh-associated wildlife. Work in areas that could cause disturbance or direct take of nesting birds (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 1, to the extent practicable. At any time of year, work within tidal salt marsh could impact California Ridgway's rails or salt marsh harvest mice. If seasonal avoidance is not possible, pre-construction surveys would be conducted for California Ridgway's rails and salt marsh harvest mice, and if these species are detected, project implementation would be delayed or redesigned, are a biological monitor would be present during construction to minimize potential impacts (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Alternative Island B would involve lowering and removing portions of levees and adding two new breaches to the north side of Pond A19. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Small fringe areas of marsh habitat exist along the levees in the Island Ponds. Potential impacts to California Ridgway's rails or salt marsh harvest mice or their habitat could occur during construction, but impacts would be minor and limited to small areas immediately adjacent to breaches or other levee alterations. Any potential minor impacts to marsh-associated wildlife due to construction activities would be greatly offset by the much larger restoration of vegetated tidal marsh over the long term. Such habitat restoration would increase the extent of habitat for all special-status, marsh-associated wildlife species substantially.

Seasonal work windows and biological monitoring would be used to avoid and minimize construction-related impacts to special-status, marsh-associated wildlife. Work in areas that could cause disturbance or direct take of nesting birds (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 1, to the extent practicable. At any time of year, work within tidal salt marsh could impact California Ridgway's rails or salt marsh harvest mice. If seasonal avoidance is not possible, pre-construction surveys would be conducted for California Ridgway's rails and salt marsh harvest mice, and if these species are detected, project implementation would be delayed, redesigned, or biological monitoring would be present during construction to minimize potential impacts.

With the implementation of the avoidance and minimization measures described above, the overall effect would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would involve lowering and removing portions of levees, adding two new breaches, widening existing breaches, and excavating pilot channels to better distribute flows and sediment within Pond A19 and increase connectivity and complexity in Ponds A20 and A21. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Construction impacts would be the same as those listed in Alternative Island B but would occur over wider areas. As in Alternative Island B, these temporary impacts would be more than offset by full marsh formation and thus increased habitat for these special-status species. Also, the avoidance and minimization measures proposed in Alternative Island B would be implemented to reduce the potential impact as a result of construction activities to a less-than-significant level.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would involve adding habitat islands, constructing habitat transition zones, improving a levee, adding five new breaches, and constructing a small portion of trail and viewing platform between Pond A1 and Charleston Slough. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The construction impacts associated with these activities could include visual/noise disturbance associated with equipment operation, crushing of individuals or nests, and habitat loss. Small fringe areas of marsh habitat exist along the levees in the Mountain View Ponds and in outer Charleston Slough. Potential impacts could occur to marsh habitat during construction, but impacts would be minor and limited to small areas. These impacts to marsh-associated wildlife due to construction activities would be greatly offset by the creation of approximately 750 acres of vegetated tidal marsh over the long term. Habitat transition zones and habitat islands would be included to increase marsh habitat diversity. Such habitat restoration would increase the extent of habitat for all special-status, marsh-associated wildlife species substantially.

Seasonal work windows and biological monitoring may be used to avoid and minimize construction-related impacts to special-status, marsh-associated wildlife. Work in areas that could cause disturbance or direct take of nesting birds (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 1, to the extent practicable. At any time of year, work within tidal salt marsh could impact California Ridgway's rails or salt marsh harvest mice. If seasonal avoidance is not possible, pre-construction surveys would be conducted for California Ridgway's rails and salt marsh harvest mice, and if these species are detected, project implementation would be delayed, redesigned, or biological monitoring would be present during construction to minimize potential impacts.

With the implementation of the avoidance and minimization measures discussed above, the overall effect of Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C involves a similar construction process as that outlined in Alternative Mountain View B with additional breaches, an improved levee on the south and west sides of Charleston Slough, and a lowered levee between Charleston Slough and Pond A1. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C. Charleston Slough would also be opened to full tidal flows instead of its current muted tidal flows. The intent of this change would be to provide tidal marsh formation in Charleston Slough, as the BCDC is requiring of the City of Mountain View, which owns the slough. The south and west levees of Charleston Slough would be raised and improved to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

The construction impacts would be similar to those listed for Alternative Mountain View B, except the overall schedule would be increased due to the additional components and the footprint associated with levee alterations along Charleston Slough would be increased. The area along Charleston Slough contains suitable marsh habitat for special-status wildlife. The salt marsh harvest mouse has been observed in this area, and the footprint of these levee improvements would be substantially wider than the current footprint. The precautions outlined in the Programmatic Biological Opinion for special-status, marsh-associated wildlife would be taken during construction to minimize impacts. The avoidance and minimization measures proposed in Alternative B would be implemented to reduce the potential for impact as a result of construction activities. Over the long term, new habitat creation would offset any temporary construction impacts, and the overall effect would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A *(*the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to add habitat transition zones to the southern corners of Pond A8S. Construction of the habitat transition zones could result in visual/noise disturbance associated with equipment operation, the crushing of individuals or nests, and habitat loss. Small fringe areas of marsh habitat exist along the levees in the A8 Ponds. Potential impacts could occur to marsh habitat during construction, but impacts would be minor and limited to small areas of marsh habitat. Any potential minor impacts to marsh-associated wildlife due to construction activities would be temporary and offset by the creation of the larger habitat transition zones, which would offer increased areas of suitable habitat for marsh-associated wildlife.

Seasonal work windows and biological monitoring may be used to avoid and minimize construction-related impacts to special-status, marsh-associated wildlife. Work in areas that could cause disturbance or direct take of nesting birds (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 1, to the extent practicable. At any time of year, work within tidal salt marsh could impact California Ridgway's rails or salt marsh harvest mice. If seasonal avoidance is not possible, pre-construction surveys would be conducted for California Ridgway's rails and salt marsh harvest mice, and if these species are detected, project implementation would be delayed, redesigned, or biological monitoring would be present during construction to minimize potential impacts.

With the implementation of the avoidance and minimization measures discussed above, the overall effect of Alternative A8 B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Alternative Ravenswood B would involve converting Pond R4 to tidal marsh with a pilot channel and breach at the entrance of the historic slough, converting Ponds R5 and S5 to deep manager ponds, adding a habitat transition zone, adding a water control structure to increase control over water levels in Pond R3, improving the interior levee between Ponds R3 and R4, lowering an outboard levee of Pond R4, and installing a viewing platform and an viewing platform.

The construction impacts associated with these activities could involve the visual/noise disturbance associated with equipment operation, the crushing of individuals or nests, and habitat loss. Because existing conditions contain minimal marsh habitat, construction-related impacts to marsh-associated wildlife species would be expected to be minimal. Small fringe areas of marsh habitat exist along the levees in the Ravenswood Ponds, and potential impacts to these areas would occur during construction. These impacts would be minor and limited to small areas, and potential impacts to marsh-associated wildlife due to construction activities would be greatly offset by the restoration of Pond R4 to tidal marsh. The habitat transition zone would increase marsh habitat diversity. The recreation and public access features would be located in places that are not habitat for these species or that are already being modified as part of the Phase 2 actions. Such habitat restoration would increase the extent of habitat for all special-status, marsh-associated wildlife species substantially.

Seasonal work windows and biological monitoring may be used to avoid and minimize construction-related impacts to special-status, marsh-associated wildlife. Work in areas that could cause disturbance or direct take of nesting birds (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 1, to the extent practicable. At any time of year, work within tidal salt marsh could impact California Ridgway's rails or salt marsh harvest mice. If seasonal avoidance is not possible, pre-construction surveys would be conducted for California Ridgway's rails and salt marsh harvest mice, and if these species are detected, implementation would be delayed, redesigned, or biological monitoring would be present during construction to minimize potential impacts.

With the implementation of the avoidance and minimization measures discussed above, the overall effect would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be converted to tidal marsh by breaching the eastern levee and breaching and lowering a portion of the northwestern levee. Alternative C would also involve the construction of habitat transition zones. Ponds R5 and S5 would be enhanced to simulate intertidal mudflats. Water control structures would also be installed to manage flows into and out of Ponds R3, R5, and S5. In addition, a boardwalk trail leading to a viewing platform in the northwestern corner of Pond R4 and interpretative platforms along the Pond R5 levee would be constructed.

Construction activities for Alternative Ravenswood C would have similar temporary impacts to fringe marsh habitat along levees as Alternative Ravenswood B. In addition to the tidal marsh habitat improvements listed in Alternative B, improvements to habitat for marsh-associated wildlife for Alternative Ravenswood C would include a tidal mudflat in Ponds R5 and S5 and a habitat transition zone along the improved interior Pond R3/R4 levee. Such habitat restoration would increase the extent of habitat for all special-status, marsh-associated wildlife species substantially.

Construction-related impacts would be minimized through the implementation of the measures described in Alternative Ravenswood B, and the overall effect of Alternative Ravenswood C would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be converted to tidal marsh by breaching the eastern levee and lowering a portion of the northwestern levee. There would also be construction of habitat transition zones. Ponds R5 and S5 would be enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily to detain peak stormwater flows and address residual salinity in Ponds R5 and S5. Water control structures would be installed on Pond R3. Recreational access would be similar to that proposed in Alternative Ravenswood B, except the northwestern trail would not be a boardwalk; rather, it would be on a levee crest. Construction impacts to habitat for marsh-associated wildlife for Alternative Ravenswood D would be similar in type and extent to those listed for Alternatives Ravenswood B and Ravenswood C. Small fringe areas of marsh habitat exist along the levees in the Ravenswood Ponds. Potential impacts could occur to marsh habitat during construction, but impacts would be minor and limited to small areas of marsh habitat. Any potential minor impacts to marsh-associated wildlife due to construction activities would be greatly offset by the restoration of Pond R4 to tidal marsh habitat over the long term.

Construction-related impacts would be minimized through the implementation of the measures described in Alternative Ravenswood B, and the overall effect of Alternative Ravenswood D would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-11: Potential construction-related loss of or disturbance to nesting pond-associated birds.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Construction related to the implementation of the SBSP Restoration Project could potentially disturb some wildlife species and in some cases could lead to the loss of individuals. Birds that nest in managed pond habitats may be adversely affected by construction activities. Such species include the double-crested cormorant, Caspian tern, Forster's tern, black skimmer, California gull, American avocet, black-necked stilt, and western snowy plover (2007 EIS/R).

Because these species occasionally nest on levees or their side-slopes or fringing marshes, tidal restoration activities such as levee breaching or lowering and pond enhancement activities such as berm construction, island construction, or installation of water-control structures could result in the direct alteration of levees and islands on which these birds nest. Levee breaching would also result in the flooding of some ponds that are currently dry, which could destroy nests placed on dried pond bottoms or islands or internal berms and levees. Construction activities would also involve the movement of heavy equipment, loud noise, and human presence in and adjacent to existing nesting habitat. These activities may result in the disturbance of birds nesting within ponds, potentially resulting in the abandonment of nests, eggs, or young, or may facilitate predation on eggs or young by causing adults to flee (2007 EIS/R).

To minimize such impacts, several measures are incorporated into the project. Work in and adjacent to potential bird-nesting habitat would be conducted outside of the avian nesting season to the extent practicable. Work in these areas that could cause disturbance or direct take (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through January 31, to the extent practicable. This condition would minimize potential impacts to nesting birds. If seasonal avoidance is not possible, pre-construction surveys would be conducted for nesting birds. If any nesting pond-associated waterbirds are detected in areas that could be disturbed by construction activities, the implementation would be delayed, redesigned, a biological monitor would be present to minimize potential impacts to actively nesting birds, or other measures could be taken to avoid impacts in consultation with USFWS and CDFW (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Alternative Island B would involve lowering and removing portions of levees and adding two new breaches. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Impacts during construction for Alternative Island B would be concentrated on the levees which are not used by nesting birds (except perhaps Canada geese (*Branta canadensis*)). However, with implementation of the minimization measures (e.g., seasonal avoidance of nesting birds, pre-construction surveys, and biological monitoring) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Construction impacts under Alternative Island C would be similar to those under Alternative Island B with the addition of two more levee breaches (into Ponds A20 and A21), longer extents of levee lowering, and two pilot channels cut into Pond A19 at existing breaches. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The result would be an increased footprint of construction activities and increased construction schedule. However, with implementation of the minimization measures (e.g., seasonal avoidance of nesting birds, pre-construction surveys, and biological monitoring) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would involve adding habitat islands, constructing habitat transition zones, improving a levee, adding five new breaches, and constructing a small portion of a trail and a viewing platform between Pond A1 and Charleston Slough. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The Mountain View Ponds contain suitable habitat for nesting pond-associated birds. Various California gull, Forster's tern, and avocet colonies, are located here, as are other nesting birds. Construction activities could impact these nesting pond-associated birds. Visual and noise impacts from construction equipment could temporarily disturb nesting birds, and construction and breaching could directly impact nesting birds through nest flooding or crushing. The creation of nesting islands and improved invertebrate habitat and fisheries would be expected to offset the short-term construction impacts and provide an overall (at least short-term) benefit to nesting pond-associated birds. With implementation of the minimization measures (e.g., seasonal avoidance of nesting birds, pre-construction surveys, and biological monitoring) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would involve a similar construction process as that outlined in Alternative Mountain View B with the inclusion of extra breaches, larger improved levees with a trail on the south and west sides of Charleston Slough, a new trail along the PG&E access route on the east side of Pond A2W, a lowered levee between Charleston Slough and Pond A1, and the opening of Charleston Slough to full tidal flows. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C.

Construction impacts would be similar to those listed for Alternative Mountain View B with the additional construction impacts and increased construction schedule associated with levee alterations along Charleston Slough and the additional trail features. The lowering of this levee may result in increased construction disturbance and reduce the long-term benefit of levee habitat for nesting; this area contains levees and islands with suitable habitat for nesting pond-associated birds. Also, the creation of nesting islands and improved invertebrate habitat and fisheries is expected to offset the short-term construction impacts and provide an overall benefit to nesting birds. With implementation of the minimization measures (e.g., seasonal avoidance of nesting birds, pre-construction surveys, and biological monitoring) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B would involve adding habitat transition zones to the southern edges of Pond A8S. The levees and adjacent ponds around the A8 Ponds contain suitable habitat for nesting pond-associated birds. The construction work would be limited to the southeastern and southwestern corners of the pond, which is already flanked by the landfill access road. These locations are one of the least likely places for birds to build nests, making impacts in these areas unlikely. Potential temporary impacts to this habitat could occur during construction activities (e.g., visual and noise disturbance, crushing of individuals or nest, habitat disturbance). With implementation of the minimization measures (e.g., seasonal avoidance of nesting birds and pre-construction surveys) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), there would be no construction, and thus no construction-related impacts would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Alternative Ravenswood B would involve converting Pond R4 to tidal marsh with a pilot channel and breach at the entrance of the historic slough, converting Ponds R5 and S5 to deep managed ponds, adding a habitat transition zone, adding water control structures, improving the All-American Canal (AAC), lowering an outbound levee, and installing a viewing platform. Impacts during construction would take place on levees and in the interior of ponds. Construction activities would temporarily impact suitable habitat for nesting pond-associated birds that use the Ravenswood Ponds and surrounding areas. However, with implementation of the minimization measures (e.g., seasonal avoidance of nesting birds and pre-construction surveys) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C is similar to Alternative Ravenswood B except that Ponds R5 and S5 would be enhanced so that they could be managed to simulate intertidal mudflats. There would also be a second levee breach in Pond R4, additional public access features, and additional water control structures. Alternative C also proposes a second habitat transition zone in Pond R4, which could increase levels of disturbance related to hauling in the fill necessary to create the habitat transition zone. Alternative C would have similar temporary impacts to suitable habitat for nesting pond-associated birds as Alternative Ravenswood B, though in more locations and for a longer construction period. However, with implementation of the minimization measures (e.g., seasonal avoidance of nesting birds and pre-construction surveys) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be converted to tidal marsh by breaching the eastern levee. Ponds R5 and S5 would be enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows and reduce residual salinity in Ponds R5 and S5. A trail leading to a viewing platform in the northwestern corner of Pond R4 and an interpretative platform along the Pond R5 levee would be constructed. Two water control structures would be installed in Pond R3, and habitat transition zones would be constructed in Pond R4.

Construction impacts to suitable habitat for nesting pond-associated birds for Alternative Ravenswood D would be similar in extent to those listed for Alternatives Ravenswood B and Ravenswood C. With implementation of the minimization measures (e.g., seasonal avoidance of nesting birds and pre-construction surveys) described above, impacts to nesting birds as a result of construction-related disturbance would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-12: Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Management, maintenance, and monitoring are expected to occur over the life of the SBSP Restoration Project. Many of these activities would be directed toward the monitoring of, or management for, particular resources of concern, and thus the net effect of these activities would be beneficial. However, these activities have the potential to adversely affect biological resources, at least in the short term. Specifically, monitoring and management activities have the potential to cause disturbance to breeding species and even site, nest, or colony abandonment. These activities may inadvertently contribute to lowered population numbers (2007 EIS/R).

Monitoring activities would include surveys of managed ponds and restored marshes. Monitoring would, for example, entail surveys for vegetation, birds, and harbor seals conducted on foot, by car, and possibly by boat and airplane or other methods. Monitoring for nesting success at bird colonies would entail entering the colonies to count and measure. Monitoring of harvest mouse populations would entail live-trapping within restored marshes. Vegetation mapping would be conducted using aerial photos and ground-truthing. Monitoring of fish would be conducted through counts (e.g., of salmonids) and sampling with nets or other methods (for estuarine fish). Impacts would primarily be minor and short term (e.g., flushing individual birds or seals along the survey route) (2007 EIS/R).

Following the breaching of levees around a pond restored to tidal action, some of the main management activities that may occur within restored tidal habitats are predator management and invasive plant management. Vector control activities—including monitoring and mosquito abatement—would also occur periodically, particularly along habitat transition zones. Therefore, management and maintenance activities associated with the SBSP Restoration Project would occur primarily in managed ponds, restored marshes, and in recreational access areas such as trails. Examples of such activities include:

- Raising or lowering water levels within ponds via inlet and outlet structures;
- Controlling vegetation on islands, in areas designed as open water habitat and along trails using mechanical control, spraying with saltwater, spraying with approved herbicides, or other means;
- Predator management, including trapping and removal of mammals and nuisance birds;
- Periodic augmentation of sediment, oyster shell, or other ground cover on islands; and
- Maintenance of levees, berms, trails, boat launches, viewing platforms, gates, and water-control structures and other features.

As part of USFWS current practices under the AMP, the SBSP Restoration Project incorporates measures to minimize impacts from monitoring, maintenance, and management, and it is anticipated that a number of measures, including seasonal work windows, pre-construction surveys, and biological monitoring, to avoid and minimize such impacts to federally listed species would be required by the BO for this project. Activities that are sufficiently loud or obtrusive enough to cause disturbance of nesting birds or pupping harbor seals or direct take (e.g., accidental crushing of individuals or nests) would be limited to the period September 15 through February 1, to the extent practicable, to minimize potential impacts to breeding species. If seasonal avoidance is not possible, habitat assessments and/or pre-construction surveys would be conducted for nesting birds, salt marsh harvest mice, and other sensitive species. If any nesting pond-associated waterbirds are detected in areas that could be disturbed by project-related construction activities, project implementation would be delayed or redesigned to minimize potential impacts to actively nesting birds (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), there would be no increase in monitoring, maintenance, and management relative to existing levels. Currently, levees are not maintained except for the levee associated with the Union Pacific Railroad track. The existing Union Pacific railroad track and associated levee would continue to be maintained, but other levees would be allowed to naturally degrade. Existing monitoring and maintenance informs adaptive management activities that are adjusted to benefit species. Impacts to sensitive wildlife species due to ongoing monitoring, maintenance, and management activities would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B offers incremental actions to enhance the transition to tidal marsh habitat. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Monitoring, maintenance, and management activities under Alternative Island B would be expected to be extremely similar to those described for Alternative Island A. The impact on wildlife from these activities would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C offers incremental actions to enhance the transition to tidal marsh habitat. Monitoring, maintenance, and management activities under Alternative Island C would be expected to be extremely similar to those described for Alternative Island A. The impact on wildlife from these activities would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. Ponds A1 and A2W would continue to function as managed ponds, and Charleston Slough would remain the muted tidal mudflat it is. The outboard levees around Ponds A1 and A2W are high-priority levees to be maintained for inland flood protection, so those levees would continue to be inspected and maintained as they presently are. As under current conditions, the ponds are actively managed , which involves circulating water as needed to maintain dissolved oxygen and control other parameters. Existing trails on many of the levees along the boundary of the Alviso-Mountain View pond cluster would continue to be maintained. The current use of water in Charleston Slough to supply the water to Shoreline Park would continue. Monitoring, including bird surveys and nest success surveys, would continue. Impacts to sensitive wildlife species due to ongoing monitoring, maintenance, and management activities would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, monitoring would include annual bird surveys, nest success, and other activities as described in the AMP. Maintenance activities would include trail upkeep, predator control, general vegetation control, invasive plant species control, and vandalism repairs. Fewer outboard levees would be maintained (or repaired on failure) than in Alternative Mountain View A, but the Pond A2W eastern levee and the armored and bridged breaches in it would be maintained to continue to provide PG&E access to the power lines. Maintenance of the PG&E boardwalk through Pond A2W would be similar to what would occur under Alternative A, but the new PG&E boardwalk north of Pond A1 would also need to be maintained. Overall, Alternative B could result in a minor decrease in the amount of levee maintenance and repair and a similarly minor increase in boardwalk inspection and maintenance relative to Alternative A and to current conditions.

The results of monitoring would inform adaptive management and the design of future phases of restoration. With implementation of avoidance and minimization measures from the AMP, impacts to biological resources as a result of monitoring, maintenance, and management activities would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Monitoring, maintenance, and management activities for Alternatives Mountain View B and Mountain View C are expected to be similar, except monitoring and maintenance would be more extensive under Alternative C due to an increased number of constructed elements. The same PG&E infrastructure improvements noted for Alternative B would also be made in Alternative C. In addition, Alternative C would include additional levee breaches, a new location for the City of Mountain View's water intake system for Shoreline Park's sailing lake, a new trail along Pond A2W, and another trail extending on a remnant levee projecting into outer Charleston Slough. Rather than the improved levee being on the west side of Pond A1, as in Alternative B, the improved levees would be on the south and west sides of Charleston Slough and would include a reconstructed trail.

Monitoring under Alternative Mountain View C would include annual bird surveys and other activities as described in the AMP. Maintenance activities would include trail upkeep, predator control, general vegetation control, and vandalism repairs. Outboard levees would be maintained (or repaired on failure) as described in the Alternative Mountain View A. The improved south and west levees of Charleston Slough, the sailing lake water intake, and associated utilities would all need more monitoring and maintenance than in the baseline condition or in Alternative A. Alternative C would also contain more public access features and trails to the outboard levees along Pond A2W and along the west side of Charleston Slough. These features and trails would increase trail maintenance activities for Alternative C.

Alternative Mountain View C would also include increased maintenance of the new water intake and associated pumps, sumps, and other infrastructure for Shoreline Park's sailing lake. Some of these maintenance activities (e.g., backflushing and cleaning the intake) would be similar to existing practices but would take place in a new location. Other actions would increase maintenance activities (e.g., there are two more sediment sumps in Alternative C than currently exist).

The results of the monitoring would inform adaptive management and the design of future phases of restoration. With implementation of program-level avoidance and minimization measures from the 2007 EIS/R, the AMP, and other Refuge and City of Mountain View management documents as well as compliance with expected permit and BO conditions, impacts to biological resources as a result of monitoring, maintenance, and management activities would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), there would be no change or increase in monitoring, maintenance, and management relative to existing activities or levels. USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish trapping and maintain existing levels of flood protection; inspections of pond infrastructure to ensure that the pond is operating as intended, tidal connectivity is achieved as intended, and water quality requirements are being met; monitoring of restoration performance; and summer water level recording. Monitoring, including bird surveys and nest success, would continue. Maintenance and management would have a net benefit on biological resources by maintaining desirable conditions, and the results of monitoring would inform adaptive management and the design of future phases of restoration. There would be no new impacts to sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, USFWS would continue to operate and maintain the ponds almost entirely in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions. These are the same management practices outlined in AlternativeA8 A. The additional activities necessary to maintain the habitat transition zones would include predator control, general and invasive vegetation control, and mosquito abatement. These activities occur already but would increase somewhat after implementation of this alternative.

Monitoring under Alternative A8 B would include bird surveys and other activities described in the AMP. The results of monitoring would inform adaptive management and the design of future phases of restoration. With implementation of the avoidance and minimization measures from the 2007 EIS/R, the AMP, and other Refuge management documents, impacts to biological resources as a result of monitoring, maintenance, and management activities would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), there would be no increase in monitoring, maintenance, and management relative to existing levels. USFWS would continue to operate and maintain the ponds in accordance with current management practices. Monitoring, including bird surveys and nest success, would continue. Maintenance and management would benefit biological resources by maintaining desirable conditions, and the results of monitoring would inform adaptive management and the design of future phases of restoration. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would continue to be maintained or repaired, as needed. Vegetation and predator control would continue to take place. There would be no new impacts to sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, general monitoring at the Ravenswood Ponds would include annual bird surveys and other activities as described in the AMP. Maintenance activities would include trail upkeep, predator control, general vegetation control, and vandalism repairs. The outboard levees of Pond R3 would be maintained (or repaired on failure) as described in Alternative Ravenswood A, but most of Pond R4’s outboard levees would be allowed to degrade with the tides. The improved levees around the AAC would also be maintained.

Alternative Ravenswood B management activities in Ponds R5 and S5 would involve managing for deep pond habitat. Water levels in Ponds R5 and S5 would be actively managed year-round using the water control structures that would be installed as a part of meeting the habitat restoration goals of these ponds. Water surface elevation in Ponds R5 and S5 would be managed to create managed pond habitat for diving and dabbling ducks and other birds by maintaining bottom depths at subtidal elevations. The salinity of these ponds could also be somewhat controlled through the use of the water control structures. Alternative B would also involve operating the water control structure on the eastern levee of Pond R3, and its outboard levee would be maintained as it is now.

With implementation of the avoidance and minimization measures from the 2007 EIS/R, the AMP, and other Refuge management documents, substantial impacts to biological resources as a result of monitoring, maintenance, and management activities would not be anticipated. Rather, maintenance and management would benefit biological resources by maintaining desirable conditions, and the results of monitoring would inform adaptive management and the design of future phases of restoration. Therefore, impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, monitoring at the Ravenswood Ponds would include annual bird surveys and other activities, as described in the AMP. Maintenance activities would include trail upkeep, predator control, general vegetation control, and vandalism repairs. The outboard levee of Pond R3 would be maintained (or repaired on failure) as described in Alternative Ravenswood A, but Pond R4's levees would be allowed to degrade with the tides. The improved levees around the AAC would also be maintained.

The Alternative Ravenswood C management activities in Ponds R5 and S5 would involve managing for intertidal mudflat habitat. The water levels in Ponds R5 and S5 would be actively managed year-round using the water control structures that would be installed as a part of meeting the habitat restoration goals of these ponds. Water surface elevation in Ponds R5 and S5 would be managed to receive regular damped or muted tidal flows and maintain the pond bottoms at an intertidal elevation to form mudflats for shorebirds. The salinity of these ponds could also be somewhat controlled through the use of the water control structures. Also, water could be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or for other management purposes.

The water levels of the borrow ditches and sloughs in Pond R3 and the pond itself would be actively managed using the two new water control structures to provide for the improvement of the existing western snowy plover habitat in Pond R3.

With implementation of avoidance and minimization measures from the 2007 EIS/R, the AMP, and other Refuge management documents, substantial impacts to biological resources as a result of monitoring, maintenance, and management activities would not be anticipated. Rather, maintenance and management would benefit on biological resources by maintaining desirable conditions, and the results of monitoring would inform adaptive management and the design of future phases of restoration. Therefore, the impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, monitoring at the Ravenswood Ponds would include annual bird surveys and other activities as described in the AMP. Maintenance activities would include trail upkeep, predator control, general vegetation control, and vandalism repairs. The outboard levees of Pond R3 would be maintained (or repaired on failure) as described in Alternative Ravenswood A, but Pond R4's levees would largely be allowed to degrade. The improved levees around the AAC would also be maintained.

The Alternative Ravenswood D management activities in Ponds R5 and S5 would involve managing for enhanced managed pond habitat. The water levels in Ponds R5 and S5 would be actively managed year-round using the water control structures that would be installed as a part of meeting the habitat restoration goals for these ponds. The water surface elevation in Ponds R5 and S5 would be managed to create managed pond habitat for diving and dabbling ducks and other birds; the bottom depths would be maintained at subtidal elevations except during storm events. Before and during storm events when the tide in Flood Slough is high, the ponds would be drawn down to provide capacity for temporary detention of stormwater runoff from Redwood City's Bayfront Canal and Atherton Channel Project. This stormwater would then be discharged back into Flood Slough when the tide is low and the slough can accept that volume of stormwater. This stormwater would enter into Pond S5 through the improved canal and culvert system that would be installed to connect the Bayfront Canal to the forebay of Pond S5. Water would be discharged from Pond S5 into Flood Slough through the water control structure between the pond and the slough. Also, water could be controlled to flow into Pond R4 as needed for flood control as an overflow stormwater detention pond from Ponds R5 and S5 or for other management purposes.

The water levels in the borrow ditches and sloughs in Pond R3 and the pond itself would be actively managed using the two new water control structures to provide for the improvement of the existing western snowy plover foraging habitat in Pond R3.

With implementation of the avoidance and minimization measures from the 2007 EIS/R, the AMP, and other Refuge management documents, substantial impacts to biological resources as a result of monitoring, maintenance, and management activities would not be anticipated. Rather, maintenance and management would benefit on biological resources by maintaining desirable conditions, and the results of monitoring would inform adaptive management and the design of future phases of restoration. Therefore, the impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-13: Potential effects of habitat conversion and pond management on steelhead.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

The federally listed threatened steelhead, California Central Coast DPS, is known to spawn in non-tidal portions of several South Bay creeks, including Coyote Creek, Stevens Creek, San Francisquito Creek, Alameda Creek, and the Guadalupe River. This anadromous species makes use of tidal habitats during its migrations between freshwater, non-tidal habitats, and oceanic habitats. Tidal brackish channels provide habitat for juveniles during the process of smoltification (i.e., physiological adaptation to the saltwater environment). As a result, steelhead are expected to use channels within tidal marshes in the South Bay, potentially anywhere in the Phase 2 project areas, but particularly along the sloughs leading to and from spawning streams (2007 EIS/R).

The SBSP Restoration Project is expected to have a net benefit to steelhead by increasing estuarine habitat. Such habitat may be especially important as rearing habitat for juveniles. However, it is possible that adult steelhead migrating upstream or downstream or juveniles foraging in estuarine habitats could inadvertently enter managed ponds and become trapped. Depending on conditions within the ponds, they could be a benefit or detriment to individual steelhead. If such fish are able to tolerate the conditions within the ponds and eventually return to tidal sloughs via pond outlets, the impact on such fish would likely not be substantial. However, managed ponds may have more shallow water, higher salinity, lower dissolved oxygen (DO) levels, or increased predation pressure (due to more limited plant cover or concentrations of fish in smaller areas) than tidal habitats. As a result, entrainment in managed ponds may impair the health or cause the mortality of steelhead (2007 EIS/R).

There is also some potential for steelhead to become temporarily "stranded" in restored marshes. For example, steelhead may enter marshes during high tides and become trapped in marsh ponds or pools (e.g., pools that form within borrow ditches, behind borrow ditch blocks). Such fish could potentially be subject to increased predation by being concentrated in small areas, but they are unlikely to perish due to low water quality or lack of food before another high tide enables them to "escape" back into channels. Finally, construction activities associated with restoration actions may create opportunities for steelhead to be entrained in cofferdams or be injured by dewatering and other activities. However, standard best management practices for in-water construction – including exclusion nets and flushing cofferdams prior to closure – will be used to reduce these risks to a level where they are less than significant.

Overall, marsh restoration is expected to have a net benefit on steelhead by providing numerous channels that would serve as rearing habitat for juveniles. Most marshes that are actively restored, as opposed to those forming unintentionally from accidental breaches (e.g., under the No Action Alternative), are expected to be well drained, with complex channel networks that would provide extensive foraging habitat and cover for steelhead without the threat of entrapping them (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Because of the location of the Island Ponds (between Coyote Creek and Mud Slough, which are known to contain steelhead), these aquatic habitats are expected to be used by steelhead. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP. As a result, Alternative A's diversified estuarine habitat would continue to develop, offering shelter and foraging habitat for juvenile steelhead.

Under Alternative Island A, the current habitat transitions would continue, and steelhead habitat would continue to improve. Impacts to steelhead under Alternative A would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, actions would be taken to enhance habitat connectivity as the Island Ponds transition to tidal marsh. Pond A19's levees would be breached and lowered along Mud Slough. Internal levees between Ponds A20 and A19 would be removed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. In-water work would be timed to the extent possible to avoid impacts to steelhead that might be migrating through Coyote Creek or Mud Slough. Overall, Alternative B would improve habitat connectivity for juvenile steelhead; Alternative B would provide access to more and better estuarine habitat for steelhead between upstream spawning areas of Coyote Creek and the marine waters of the Bay.

Actions taken in Alternative Island B would continue to create diversified estuarine habitat offering shelter and foraging habitat for juvenile steelhead. Therefore, impacts to steelhead under Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, actions would be taken to enhance habitat connectivity as the Island Ponds transition to tidal marsh. Levees would be breached in Ponds A19, A20, and A21, and levees would be lowered in Ponds A19 and A20. Internal levees between Ponds A19 and A20 would be removed. Pilot channels would be cut into Pond A19. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. In-water work would be timed to the extent possible to avoid impacts to steelhead that might be migrating through Coyote Creek and Mud Slough. Overall, Alternative C would improve habitat connectivity for juvenile steelhead; Alternative C would also provide access to more and better estuarine habitat for steelhead migrating between upstream spawning areas of Coyote Creek and the marine waters of the Bay. Cutting pilot channels into Pond A19 would increase ease of access to tidal marsh habitat for steelhead.

Actions taken in Alternative Island C would continue to create diversified estuarine habitat offering shelter and foraging habitat for juvenile steelhead. Therefore, impacts to steelhead under Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds. Under the No Action Alternative, there would be no impact to steelhead because the ponds would be maintained and managed to preserve their current function and condition.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, actions would include breaching Ponds A1 and A2W to restore them to tidal marsh, constructing habitat transition zones, and providing a variety of other habitat enhancements (e.g., islands for birds). PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The breach locations would be chosen in part to provide easier access to the ponds for steelhead smolts. In particular, Pond A2W would be breached adjacent to the mouth of Stevens Creek/Whisman Slough. Stevens Creek contains upstream steelhead spawning habitat and access to tidal marsh at the mouth of Stevens Creek/Whisman Slough would create beneficial habitat for out-migrating steelhead in the form of nursery habitat where they could forage and grow larger prior to continuing their migration into the Bay itself. Because of the location of the Mountain View Ponds (adjacent to Stevens Creek, which has connectivity to upstream steelhead spawning areas), these restored aquatic habitats are expected to be used by steelhead. Steelhead are not expected to be in Pond A2W when the PG&E boardwalk improvements are conducted. However, there could be short-term construction impacts and minimal long-term shading impacts associated with the new PG&E boardwalk north of Pond A1. In-water work would be timed to the extent possible to avoid impacts to steelhead that might be migrating through Stevens Creek/Whisman Slough. If fish rescue and/or relocation are required during construction, these activities would be completed under an agency-approved plan to limit impacts.

The water intake for Shoreline Park's sailing lake (at the foot of Charleston Slough's southern end) currently takes in 8 to 10 million gallons per day. This intake has some limited potential to entrain steelhead that enter the muted tidal Charleston Slough through the outer levee's tide gate structure and swim the length of the slough. There are no reported instances of steelhead or other special-status fish species entering this intake. Under Alternative Mountain View B, there would be no operational change to this intake, and no changes in the associated impacts to steelhead would be expected.

Actions taken in Alternative Mountain View B would continue to create diversified estuarine habitat offering shelter and foraging habitat for juvenile steelhead. The net effect of actions taken under Alternative Mountain View B would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Under Alternative Mountain View C, steelhead would receive the same habitat enhancements via access to the newly opened ponds as in Alternative Mountain View B. The main difference between Alternatives B and C that could impact steelhead habitat would be additional breaches in Charleston Slough under Alternative C to open the slough to fully tidal flows, with the purpose of enhancing habitat connectivity during the transition from mudflat to vegetated tidal marsh. In Alternative C, two additional breaches are proposed for Charleston Slough. In both alternatives, Pond A2W would be breached adjacent to the mouth of Stevens Creek/Whisman Slough. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C.

Stevens Creek/Whisman Slough contains upstream steelhead spawning habitat, and access to tidal marsh at the mouth of Stevens Creek would create beneficial habitat for out-migrating steelhead, as described for Alternative Mountain View B. Because of the location of the Mountain View Ponds (adjacent to Stevens Creek, which has connectivity to upstream steelhead spawning areas), these restored aquatic habitats are expected to be used by steelhead.

General construction impacts and the avoidance measures described for Alternative Mountain View B would apply to Alternative Mountain View C. However, the restored tidal marsh in Charleston Slough would create increased beneficial habitat for out-migrating steelhead. Actions taken in Alternative C would continue to create diversified estuarine habitat offering shelter and foraging habitat for juvenile steelhead. Actions proposed for Alternative C could be more beneficial than those proposed under Alternative B because increased estuarine habitat would result from the restored tidal marshes in Charleston Slough.

However, the enhanced habitat connectivity could increase the potential for steelhead to enter the water intake systems for Shoreline Park's sailing lake in either the new location at the breach between Pond A1 and Charleston Slough or the current location (which would be left in place as a secondary or backup intake). The water intake for Shoreline Park's sailing lake currently takes in 8 to 10 million gallons per day. The current risks of entraining steelhead (discussed under Alternative Mountain View B) would increase in the new location due to the increased use of the adjacent ponds by smolts and juvenile fish. However, as noted above, Alternative Mountain View C would provide large areas of improved estuarine habitat for steelhead, particularly in the smolt stage. Overall, the improvement in nursery and foraging habitat that would be created by the restoration of Charleston Slough and Ponds A1 and A2W to tidal marsh would outweigh the potential impact to steelhead from entrainment at the sailing lake water intake (Hobbs, pers. comm., December 14, 2014). As a result, the impact of Alternative C on steelhead is expected to be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish trapping and maintain existing levels of flood protection.

During Phase 1, a reversible, variable-size notch was emplaced along Alviso Slough to allow for muted tidal flow into Pond A8. Steelhead use Alviso Slough to migrate between marine waters and upstream spawning areas in the Guadalupe River, and migrating fish could potentially enter Pond A8 through its intake structure. However, because of the seasonal closure of the notch, few steelhead would be expected to be adversely affected by entrapment. Currently, the gates on the reversible armored notch at Pond A8 are kept shut during the smolt outmigration to prevent entrapment, though there are ongoing discussions with NOAA Fisheries and experiments being conducted to see how many smolts enter and/or leave the A8 Ponds through the notch. Any fish that enters through the open structures could potentially exit the same way, but may also become trapped or face increased predation.

In this experiment, smolts are collected and tagged with electronic transceivers in the headwaters of the Guadalupe River, and detector arrays are placed in the river just below the tagging location and at the notched entrance to the A8 Ponds. The idea is that smolts will be counted as they begin their migration and again at the point where they either safely enter the Bay or enter the A8 Ponds through the notch. A second detection by the sensors at the notch would indicate that the individual smolt was able to successfully exit the pond. If the experiment shows that fish do get trapped in the pond, then seasonal closures of the notch during migration will continue.

The preliminary results of the first-year of the smolt tracking experiment (Hobbs et al. 2014) were somewhat inconclusive due to the extremely low amounts of rainfall and runoff through Alviso Slough and the technical failure of sensors during a large portion of the smolt migration period. There were 70 individual smolts tagged with the electronic transceivers, and 6 of them were detected at the upstream array below the location where they were collected and tagged. The rest of the individuals either did not migrate this year or passed by that upstream detector array without being detected. Later, the array at the A8 notch detected one smolt passing through it. That was the only smolt tracked at that location, and it was during an ebb tide when water is flowing out of the notch. The researchers inferred that the detected individual was leaving the pond when detected because smolts are generally not strong swimmers and tend to float with the downstream flows or tides more often than they swim against them.

Overall, due to appropriate management of the notch opening, entrapment of steelhead within the pond would likely result in a very low-level effect. Under the No Action Alternative, there would be no change in the impacts of pond management to steelhead.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, the impacts to steelhead would be similar to impacts under Alternative A8 A. One or two habitat transition zones would be added to the southern interior corners of Pond A8S. USFWS would continue to operate and maintain the ponds and the water intake structure in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions, as described above.

The construction of the habitat transition zones would be expected to result in little, if any, increased impact to steelhead relative to baseline and future management. Impacts would be the same as in the baseline condition and would be similar to impacts under Alternative A, pending the results of the experiments on smolt use of the A8 Ponds. In the long term, the conversion to tidal marsh would be expected to be beneficial due to the additional habitat created, which would outweigh the minor short-term impacts associated with the construction of the habitat transition zones. Thus, the impact of Alternative B would less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action, Bay connectivity, and steelhead habitat due to the lack of existing breaches in the levee system surrounding the Ravenswood Ponds.

Under the No Action Alternative, there would be no change in pond management and no impacts to steelhead.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached and opened to tidal action. Water control structures installed on Ponds R5 and S5 would control water flow between these ponds, Pond R4, and Flood Slough. Another water control structure would be added to connect Pond R3 to Ravenswood Slough and control water levels in the pond. The breaching of Pond R4 would result in an increase in tidal marsh estuary habitat, which could potentially be used by migrating steelhead. However, there are no steelhead spawning streams adjacent to the Ravenswood Ponds, and therefore steelhead are not expected to migrate through sloughs or waterways nearby. Thus, steelhead are unlikely to stray into Pond R4. Because it is unlikely that steelhead will be in the vicinity of the Ravenswood Ponds, actions here would have no impacts to steelhead.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C, actions with potential impacts to steelhead in Pond R4 would be similar to those described for Alternative Ravenswood B (e.g., the breaching of Pond R4 and conversion to tidal marsh). As discussed for Alternative Ravenswood B, because steelhead are not expected to enter this pond, actions performed under Alternative C would similarly have no impact on steelhead.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Under Alternative Ravenswood D, actions with potential impacts to steelhead in Pond R4 would be similar to those described for Alternative Ravenswood B (e.g., the breaching of Pond R4 and conversion to tidal marsh). As discussed for Alternative Ravenswood B, because steelhead are not expected to enter this pond, actions performed under Alternative D would similarly have no impact on steelhead.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.5-14: Potential impacts to estuarine fish.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Overall, SBSP Restoration Project effects on estuarine fish are expected to be beneficial. In the South Bay, managed ponds support lower diversity of native fishes than tidal habitats, and only a few species are present in managed ponds in large numbers. Conversely, many of the fish recorded in the South Bay use tidal channels and mudflats at high tide, when they are inundated. These tidal habitats are particularly important as nursery habitat for juvenile fish. Thus, these tidal channels and mudflats are productive foraging habitats for estuarine fish in this system (Harvey 1988), and conversion of managed ponds to tidal habitats is expected to result in substantial increases in estuarine fish populations in the South Bay (2007 EIS/R).

Effects to green sturgeon (*Acipenser medirostris*) and longfin smelt (*Spirinchus thaleichthys*) are also covered with estuarine fish. Green sturgeon are anadromous fish that spend most of their adult life in the ocean or Bay, only entering freshwater rivers of the Sacramento River Basin to spawn (Moyle 2002). Juveniles spend 1 to 4 years rearing in freshwater, occupying shallow, low-flowing environments and feeding on amphipods and mysid shrimp. Green sturgeon are known to occur in the South Bay, but do not spawn in this area and are not expected to enter the ponds. Longfin smelt are present year-round in the South Bay. They have been caught in Coyote Creek and Alviso Slough and could be present in Pond A8 but have not yet been detected there. The longfin smelt a state-listed threatened species that is also a candidate for listing under the federal Endangered Species Act. The potential for adverse effects of restoration on estuarine fish is primarily from low water quality in discharges from managed ponds. However, through adaptive management, USFWS and CDFW have developed methods for minimizing low DO discharges. Finally, construction activities associated with restoration actions may create opportunities for fish to be entrained in cofferdams or be injured by dewatering and other activities. However, standard best management practices for in-water construction – including exclusion nets and flushing cofferdams prior to closure – will be used to reduce these risks to levels where they are less than significant.

The conversion of managed ponds to tidal habitats as part of the SBSP Restoration Project would further reduce this potential impact (2007 EIS/R). Further, because Phase 2 actions would generally increase the transition of former salt-production ponds into tidal marsh, the expectation is that there would be and improvement in the amount and quality of habitat for estuarine fish.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP. As a result, Alternative A’s, diversified tidal marsh would continue to develop, offering shelter and foraging habitat for estuarine fish.

Under Alternative Island A, the current habitat transitions would continue, and estuarine fish habitat would continue to improve. Impacts to estuarine fish under Alternative Island A would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, actions would be taken to enhance habitat connectivity as the Island Ponds transition to tidal marsh. Pond A19's levees would be breached and lowered along Mud Slough. The internal levees between Ponds A19 and A20 would be removed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. In-water work would be timed to the extent possible to avoid impacts to estuarine fish that might be present within the ponds or adjacent sloughs. Overall, Alternative Island B would improve habitat connectivity for estuarine fish; Alternative Island B would provide access to more and better connectivity between estuarine habitat and the existing open waters of the Bay. The impacts and benefits associated with Alternative B would be similar to those under Alternative Island A.

Under Alternative Island B, the current habitat transitions would continue, and estuarine fish habitat would continue to improve. Impacts to estuarine fish under Alternative Island B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, actions would be taken to enhance habitat connectivity as the Island Ponds transition to tidal marsh. Levees would be breached and lowered along Mud Slough in all ponds. Internal levees between Ponds A19 and A20 would be removed. Alternative Island C offers additional breaches and pilot channels cut into the marsh to further facilitate the development of subtidal channels and sloughs that are present in a diversified tidal marsh habitat. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. In-water work would be timed to the extent possible to avoid impacts to estuarine fish that might be present within the ponds or adjacent sloughs. The benefits associated with Alternative C would be the same as those under Alternatives Island A and Island B.

Under Alternative Island C, the current habitat transitions would continue, and estuarine fish habitat would continue to improve. Impacts to estuarine fish under Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds. Existing impacts to estuarine fish could include low water quality in discharges from managed ponds; however, these impacts are generally minor because pond managers monitor and manage for low water quality discharges. Also, there is some potential for entrapment of estuarine fish within the managed ponds. No activities or pond management changes would be proposed under Alternative A; therefore, there would be no impacts to estuarine fish relative to the baseline condition as a result of this alternative.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, actions would include breaching Ponds A1 and A2W to restore them tidal marsh, constructing habitat transition zones, and constructing habitat islands. The breach locations would be chosen in part to provide easier access to the ponds for juvenile fish and to align with historic slough locations that would facilitate the development of complex estuary habitats. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The construction and improvement of the PG&E boardwalk and tower foundations would have temporary construction and minimal long-term shading impacts (for the new segment outside of Pond A1). In-water work would be timed to the extent possible to avoid impacts to estuarine fish that might be present within the ponds or adjacent sloughs. If fish rescue and/or relocation would be required during construction, these activities would be completed under an agency-approved plan to limit impacts. The planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity that is expected to be beneficial to estuarine fish.

The water intake for Shoreline Park's sailing lake (at the foot of Charleston Slough's southern end) currently takes in 8 to 10 million gallons per day. This intake has some potential to entrain estuarine fish that enter the muted tidal Charleston Slough through the outer levee's tide gate structure and swim the length of the slough. There are no reported instances of large numbers of fish kills in this intake; the City of Mountain View is required to report kills of over 100 fish. Under Alternative Mountain View B, there would be no operational change to this intake, and no changes in associated impacts to estuarine fish are expected.

Impacts to estuarine fish under Alternative Mountain View B would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Under Alternative Mountain View C, estuarine fish would receive the same habitat enhancements via access to the newly opened ponds as in Alternative Mountain View B. The difference in Alternative Mountain View C is that additional breaches in Ponds A1 and A2W and at Charleston Slough and the removal of the levee between Pond A1 and Charleston Slough would result in a larger and more connected estuarine habitat as the ponds and Charleston Slough transition to tidal marshes. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C.

In-water work would be timed to the extent possible to avoid impacts to estuarine fish that might be present within the ponds or adjacent sloughs. If fish rescue and/or relocation are required during construction, it would be completed under an agency-approved plan to limit impacts. Tidal marsh also provides valuable nursery habitat for fish, and the transition to tidal marsh habitat at an increased rate is expected to benefit fish species.

However, the enhanced habitat connectivity could increase the potential for estuarine fish to enter the water intake systems for Shoreline Park's sailing lake in either the new location at the breach between Pond A1 and Charleston Slough or the current location (which would be left in place as a secondary or backup intake). The sailing lake water intake currently takes in 8 to 10 million gallons per day. The current risks of entraining fish (discussed in Alternative Mountain View B) would increase in the new location and with the increased habitat connectivity and expected increase in use of Ponds A1 and A2W by estuarine fish. Overall, the improvement in nursery and foraging habitat, particularly for juvenile life stages, that would be created by the restoration of Charleston Slough and Ponds A1 and A2W to tidal marsh would outweigh the potential impact to estuarine fish from entrainment at the sailing lake intake systems. As a result, impacts to estuarine fish under Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish trapping and maintain existing levels of flood protection.

During Phase 1, a reversible, variable-size notch was emplaced along Alviso Slough, allowing for muted tidal flow into Pond A8. Estuarine fish could potentially enter Pond A8 through its intake structure. However, because of the seasonal closure of the notch, few fish are expected to be adversely affected by entrapment. Any fish that enter through the open structures could exit the same way, but is likely to become stranded in the pond. Under the No Action Alternative, there would be no change in the pond notch configuration or operations and thus no impacts to estuarine fish habitat.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, two habitat transition zones would be added to the southern interior corners of Pond A8S. The impacts to estuarine fish would be the similar to those under Alternative A8 A because the placement of fill material to construct habitat transition zones would be done while the notch is closed, thus limiting the potential to affect fish. Once the habitat transition zones are in place, the USFWS would continue to operate and maintain the ponds and water intake structure in accordance with ongoing management practices that have been in place since the implementation of Phase 1 actions. Under Alternative B there would be no change in the pond notch configuration or operations and thus no impacts to estuarine fish habitat.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action, Bay connectivity, and lack suitable habitat for estuarine fish due to the absence of existing breaches in the levee system surrounding the Ravenswood Ponds. Under the No Action Alternative, there would be no impacts to estuarine fish habitat.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, actions with potential to affect estuarine fish habitat would include tidal marsh restoration in Pond R4. A water control structure would be added at the location of a historic slough at Pond R3's border with Ravenswood Slough. The water control structures installed on Ponds R5 and S5 would control water flow between these ponds, Pond R4, and Flood Slough. Pond R4 would be breached and opened to tidal action; the result would be an increase in tidal marsh at Pond R4, providing additional habitat for estuarine fish. Green sturgeon are known to occur near the Ravenswood pier; although they do not use the tidal marsh habitat for spawning, they could benefit from improved habitat for their prey species.

Actions taken in Alternative Ravenswood B would create a diversified tidal marsh offering shelter and foraging habitat for estuarine fish. Therefore, impacts would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached and restored to tidal marsh, as described for Alternative Ravenswood B. An additional breach would be provided in the northwest corner to provide connectivity with Greco Island. A water control structure would be at the location of a historic slough at Pond R3, and water control structures on Ponds R5 and S5 would also be constructed to manage flows. Additional habitat transition zones along the Pond R3/R4 levee would decrease the total area being restored to tidal marsh in Pond R4 relative to Alternative B.

The benefit to estuarine fish in the development of tidal marsh habitat in Pond R4 would be the same as described for Alternative Ravenswood C. The connection to Greco Island would add additional value to this habitat. Green sturgeon are known to occur near the Ravenswood pier; although they do not use the tidal marsh habitat for spawning, they could benefit from improved habitat for their prey species. The water control structure on Pond R3 has some potential to lead to the entrainment of fish within Pond R3, but would be carefully managed to limit entrainment. The structure would only be opened periodically, and efforts would be made to scare fish away from the structure before opening. The potential impact of entrapment is small relative to the benefits provided by the tidal marsh habitat. Therefore, impacts would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached and restored to tidal marsh, as described for Alternatives Ravenswood B and Ravenswood C. Unlike Alternative C, there would be no levee lowering for improved connections to Greco Island, but water control structures would still be provided at Ponds R3, R5, and S5, and the habitat transition zones would still be constructed as described above. Alternative D would also include construction to connect Pond S5 with the Bayfront Canal to allow temporary floodwater detainment during storm events.

The benefits and impacts associated with Alternative Ravenswood D would be similar to those described for Alternative Ravenswood C. It is unlikely that estuarine fish in Ponds R5/S5 would be adversely affected by the occasional stormwater inputs from the Bayfront Canal and Atherton Channel Project. Estuarine fish could, however, use the created tidal marsh habitat. Therefore, impacts would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-15: Potential impacts to piscivorous birds.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

The piscivorous birds (e.g., pelicans, cormorants, grebes) of the South Bay forage in a variety of habitats and locations where prey fish are available. The low-salinity ponds that support fish, tidal sloughs and channels, edges of intertidal mudflats, channels, and artificial lakes such as Shoreline Lake provide the highest-quality foraging areas. Large “frenzies” of feeding activity may be observed at these locations, presumably when conditions result in large fish concentrations. Brown pelicans plunge-dive for fish and therefore require water several feet deep, but American white pelicans and cormorants swim while feeding and can thus feed in shallower water. Although double-crested cormorants, western grebe (*Aechmophorus occidentalis*) and Clark’s grebes (*Aechmophorus clarkii*), and brown pelicans forage to varying degrees within the open waters of the Bay, American white pelicans do not, instead preferring non-tidal waterbodies (Cogswell 2000; Harvey 1988;) (2007 EIS/R).

The effects of the SBSP Restoration Project on foraging piscivores depend in part on the project’s effects on both the abundance and the availability of prey fish. Existing managed ponds with connections to the Bay may concentrate fish, thus potentially facilitating their capture by piscivorous birds. As a result, conversion of some low-salinity ponds to tidal habitats would reduce foraging habitat in managed ponds. However, as noted in the discussion of estuarine fish (Phase 2 Impact 3.5-14), tidal restoration is expected to result in a considerable increase in the abundance of estuarine fish in the South Bay, and the tidal sloughs and channels that would develop in restored marshes are expected to be used heavily by foraging piscivores. The SBSP Restoration Project is expected to have a net benefit to most piscivorous species, because the minor impacts from the loss of managed ponds would be offset by improvements in foraging quality through increased shallow-water habitat for fish and invertebrates (2007 EIS/R).

The most important piscivorous species addressed in this section that may decline substantially due to the loss of managed pond habitat is the American white pelican (California species of special concern on their nesting grounds only), which does not forage heavily in tidal habitats (2007 EIS/R). However, the American white pelican does not nest in the SBSP Restoration Project area, and foraging of other pond-associated piscivorous birds is expected to redistribute to other managed ponds in the area (e.g., adjacent managed ponds). Therefore losses from the South Bay are not expected to result in substantial declines on the scale of the west coast or continental populations.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh.

These shallow ponds currently provide limited foraging opportunities for piscivorous birds. The ongoing restoration of tidal marsh habitat is expected to increase the abundance of estuarine fish. This increase would be beneficial to piscivorous birds, because it would increase their prey base. Therefore, Alternative Island A would have a less-than-significant impact under CEQA and be beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, actions would be taken to enhance habitat connectivity and complexity as the Island Ponds transition to tidal marsh. Pond A19's levees would be breached and lowered along Mud Slough. Internal levees between Ponds A19 and A20 would be removed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

As under Alternative Island A, the restoration to tidal marsh is expected to increase the abundance of prey (estuarine fish) for piscivorous birds. These actions would further improve the ponds' ability to offer habitat for estuarine fish by providing increased connectivity and complexity. Therefore, the impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, actions would be taken to enhance habitat connectivity and complexity as the Island Ponds transition to tidal marsh. Levees would be breached and lowered along Mud Slough in all ponds. The internal levees between Ponds A19 and A20 would be removed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Alternative C would offer additional breaches and pilot channels cut into the marsh to further enhance the development of the subtidal channels and sloughs that are present in a diversified tidal marsh habitat.

Like Alternative Island B, actions taken in Alternative Island C would improve the ponds' ability to offer improved estuarine fish habitat that would benefit piscivorous birds. Therefore, the impact of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as they do now. The outboard levees around Ponds A1 and A2W are high-priority levees to be maintained for inland flood protection and for PG&E access and would continue to be maintained for those purposes.

Piscivorous birds would not be impacted under Alternative Mountain View A. The Mountain View Ponds currently offer a mix of low-salinity pond foraging habitat in Ponds A1 and A2W and intertidal mudflat habitat in Charleston Slough. The No Action Alternative would maintain the managed low-salinity ponds in their current state, which provides suitable habitat for piscivorous birds.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to support the development of tidal marshes. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers. Nesting and roosting habitat would be increased through the construction of nesting islands and habitat transition zones. With selective breaching along historic slough meanders and the addition of island habitat, these restored aquatic areas would develop into complex tidal marsh habitat with benefits to piscivorous bird species that forage in the tidal channels, sloughs, and open subtidal habitats.

The construction and improvements of the PG&E boardwalks could result in some temporary disturbance of foraging piscivorous birds. Also, some small amounts of levee that could provide roosting habitat would be removed when Ponds A1 and A2W are breached. Pond-associated piscivores, such as the American white pelican, would likely decline locally as a result of the loss of managed pond habitat. However, some redistribution of foraging birds (e.g., to adjacent managed ponds) would be expected, and losses from the South Bay would not be expected to result in substantial declines on the scale of the west coast or continental populations.

Actions taken in Alternative Mountain View B would benefit piscivorous bird species that use tidal channels, sloughs, and open subtidal habitats through improved forage of estuarine fish, but pond-associated piscivorous bird species may decline locally. However, redistribution to suitable managed pond habitat would be expected, and the declines would not be expected to be substantial on the scale of the west coast or continental populations. Therefore, the impact of Alternative Mountain View B would be less than significant under CEQA.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C is similar to Alternative Mountain View B, with the addition of more breaches in Pond A1 levees and levee lowering between Pond A1 and Charleston Slough to increase the habitat connectivity between these two waterbodies as they transition to tidal marsh. The same PG&E infrastructure improvements noted for Alternative B would also be made in Alternative C. Alternative C would also have minor changes to the habitat transition zones, increased recreational access, a new water intake in a different location for Shoreline Park's sailing lake, and improvements to the southern and western levees of Charleston Slough. Nesting islands and habitat transition zones would still be constructed under Alternative C, though the one in Pond A2W would be somewhat smaller.

The construction and improvements of the PG&E boardwalks could result in some temporary disturbance of foraging piscivorous birds. Also, construction of recreational trails could reduce roosting habitat along the levees. However, under Alternative Mountain View C, constructed islands and habitat transition zones would provide increased roosting habitat for piscivorous birds.

Under Alternative Mountain View C, Charleston Slough would be expected to be more successful in transitioning to tidal marsh, resulting in further increases in fisheries for channel-foraging piscivorous birds. The current mudflat habitat of Charleston Slough provides little foraging habitat for piscivorous birds, so this transition would be a net increase. As described for Alternative Mountain View B, actions taken in Alternative C would benefit piscivorous bird species that use tidal channels, sloughs, and open subtidal habitats, but pond-associated piscivorous bird species may decline locally. However, pond-associated piscivorous birds are expected to redistribute foraging to nearby suitable managed pond habitat, and population declines would not be expected to be substantial on the scale of the west coast or continental populations. Therefore, the impact of Alternative C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. USFWS would continue to operate and maintain the ponds in accordance with the management practices that have been in place since the implementation of the Phase 1 actions.

The A8 Ponds are managed ponds with muted tidal action. The muted tidal ponds provide foraging habitat for pond-associated piscivorous birds, such as the American white pelican (which does not forage in the open bay) and the brown pelican (which needs several feet of water to plunge-dive for fish).

The No Action Alternative would maintain habitat for pond-associated piscivorous bird species. No impacts to piscivorous birds would take place under this alternative.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, one or two habitat transition zones would be added to the southern interior corners of Pond A8S. USFWS would continue to operate and maintain the ponds as subtidal habitat with muted tidal action.

Current management practices would not change. A small amount of pond habitat would be lost at the location of the habitat transition zones, but this loss would be minor relative to the remaining pond habitat. Under Alternative A8 B, the impacts to piscivorous bird species would be unchanged relative to the baseline conditions and similar to impacts described for the No Action Alternative. Therefore, the impact of Alterative A8 B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action and Bay connectivity and do not currently provide suitable habitat for prey fish species. Nor do many piscivorous birds roost there. Under the No Action Alternative, there would be no impact to piscivorous bird habitat.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would transition to tidal marsh habitat, and Ponds R5 and S5 would become enhanced managed ponds. The levee at Pond R4 would be breached at the historic slough to facilitate tidal flows in the pond. A water control structure would be installed at the location of a historic slough at Pond R3, and water control structures would connect Ponds R5 and S5 to Pond R4 (and indirectly to the Bay) and Flood Slough. A habitat transition zone would be created along Bedwell Bayfront Park, and a portion of levee would be maintained in Ponds R5/S5 for roosting habitat.

The restoration of tidal marsh in Pond R4 would provide increased nursery habitat for estuarine fish. Fish abundance is expected to increase in the new tidal slough and channel networks and in the adjacent sloughs and open water, benefiting piscivorous bird species. Currently, Pond R4 is dry for most of the year and does not contain fish. Ponds R5 and S5 would be enhanced managed ponds, which would provide foraging opportunities for pond-foraging piscivorous birds, such as the American white pelican, although the small size of these ponds and their close proximity to public access areas may limit their use by this species. The island in Ponds R5/S5 would provide some potential roosting habitat.

Actions taken in Alternative Ravenswood B would continue to create a diversified tidal marsh offering improved foraging habitat. Alternative B would benefit piscivorous birds by improving fisheries in the tidal marsh habitat and providing potential additional managed pond habitat for foraging. The impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached and restored to tidal marsh as described for Alternative Ravenswood B. An additional breach would be provided in the northwest corner to provide connectivity with Greco Island. A water control structure would be installed at the location of a historic slough at Pond R3, and water control structures on Ponds R5 and S5 would also be constructed to manage flow. Under Alternative C, mudflat habitat rather than enhanced managed pond habitat would be created at Ponds R5/S5. Additional habitat transition zones along the Pond R3/R4 levee would decrease the total area being restored to tidal marsh in Pond R4 relative to Alternative B.

As described for Alternative Ravenswood B, Alternative Ravenswood C would also benefit piscivorous birds through increased availability of tidal marsh foraging habitat. However, the mudflat habitat created at Ponds R5/S5 would be less beneficial to pond-associated piscivorous birds than the managed pond habitat created under Alternative B. Although less beneficial than Alternative B, the habitat would be improved relative to the baseline. Therefore, the impacts of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached and restored to tidal marsh as described for Alternatives Ravenswood B and Ravenswood C. Unlike Alternative C, there would be no connection to Greco Island, but water control structures would still be provided at Ponds R3, R5, and S5 and the habitat transition zones would still be constructed. Alternative D would also include construction to connect Pond S5 with the Bayfront Canal to allow flood storage during storm events.

The impacts and benefits of Alternative Ravenswood D would be similar to those of Alternative Ravenswood B. The creation of tidal marsh in Pond R4 would benefit piscivorous birds. Under Alternative D, water in Ponds R5 and S5 would need to be drawn down in the winter to provide flood capacity for storm events, but would still provide pond foraging habitat during other times of the year. Therefore, the impacts of Alternative D would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-16: Potential impacts to dabbling ducks.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 actions on dabbling ducks are assessed.

Dabbling ducks forage in a variety of habitats in the South Bay, including mudflats, shallow subtidal habitats, tidal sloughs and marsh channels, marsh ponds, managed and muted tidal marsh, seasonal wetlands, managed ponds, and water treatment plants. In these areas, dabbling ducks feed on a variety of aquatic plants and invertebrates. Because dabbling ducks do not typically dive for food, dabbling ducks usually forage in water less than 12 inches deep (Goals Project 2000). Within ponds, salinity is also important for these birds. The plants on which many dabbling ducks feed cannot tolerate high salinities, and thus dabbling duck abundance tends to be highest on lower-salinity ponds (20 to 63 ppt salinity), with few in ponds greater than 154 ppt salinity (2007 EIS/R).

Because large numbers of dabbling ducks use shallow managed ponds in the South Bay for foraging and roosting, conversion of ponds to tidal habitats is expected to have some effect on South Bay numbers of these birds. However, most dabbling ducks are expected to take advantage of the extensive foraging habitat, roosting habitat, and cover provided by tidal channels and sloughs and marsh ponds, and tidal restoration would also increase nesting habitat availability in high marsh. There is some potential for density-dependent mortality due to disease (such as avian botulism; see Phase 2 Impact 3.5-22), predation, and disturbance by predators and humans as the ducks that use managed ponds are concentrated into fewer areas as a result of pond conversion. However, ongoing restoration should result in dispersion of dabbling ducks over the entire SBSP Restoration Project area, ameliorating such adverse effects of concentration. A possible exception to this expected dispersion is the northern shoveler, which appears to prefer ponds to open bay or tidal marsh habitat. The response of this species to Phase 2 actions will be monitored and adapted to under the AMP.

Overall, tidal restoration is expected to more than offset these adverse effects, and the net effect of tidal restoration is expected to be beneficial (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh.

The tidal marshes that develop in the breached ponds would be expected to provide roosting and foraging habitat for dabbling ducks. Therefore, the impact of Alternative Island A would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, actions would be taken to enhance connectivity as the ponds transition to tidal marsh. Pond A19’s levees would be breached and lowered along Mud Slough. The internal levees between Ponds A19 and A20 would be removed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

Under Alternative Island B, habitat transition would be similar to that in Alternative Island A, but would occur in different locations in Pond A19 and Mud Slough. Also, active, intentional restoration under the Action Alternatives would involve breaches at strategic locations to take advantage of remnant slough networks and would facilitate the development of complex channel networks. The actions taken in Alternative B would continue to create tidal marsh, offering shelter and foraging habitat for dabbling ducks. The overall impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, additional actions would be taken to further enhance connectivity as the ponds transition to tidal marsh. Levees would be breached and lowered along Mud

Slough in all ponds. The internal levees between Ponds A19 and A20 would be removed. Alternative C would offer additional breaches and pilot channels cut into the marsh to further facilitate the development of the subtidal channels and sloughs that are present in a diversified tidal marsh habitat. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

Habitat transition under Alternative Island C would be similar to that under Alternative Island B, but would occur in different locations in all three ponds and in Mud Slough. The actions taken in Alternative C would continue to create tidal marsh offering shelter and foraging habitat for dabbling ducks. Therefore, the impact of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds. The outboard levees around Ponds A1 and A2W are high-priority levees to be maintained for inland flood protection and PG&E access to the power lines above Pond A2W, and they would continue to be maintained for these purposes.

The Mountain View Ponds currently offer managed pond habitat that is used by dabbling ducks, diving ducks, and piscivorous birds. The No Action Alternative would maintain the managed low-salinity ponds in their current state, which provides suitable habitat for dabbling ducks. Under the No Action Alternative, there would be no impact to dabbling duck habitat.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached to support the development of tidal marshes. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers. Nesting and roosting habitat would be increased through the construction of nesting islands and habitat transition zones. With selective breaching along historic slough meanders and the addition of island habitat, these restored aquatic areas would develop into complex tidal marsh habitat with benefits to dabbling duck species that forage in the tidal channels, sloughs, and open subtidal habitats.

The construction and improvement of the PG&E boardwalk and tower foundations could result in short-term disturbance to foraging dabbling ducks. However, the planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity, which is expected to provide foraging habitat and cover for dabbling ducks. High marsh habitat in the transition zones could increase nesting habitat.

Pond-associated foraging habitat for dabbling ducks would decline under Alternative Mountain View B, but tidal marsh and mudflat foraging would improve. Dabbling ducks may also benefit from increased nesting and roosting habitat on the islands and habitat transition zones. Further, the implementation of ongoing monitoring and management actions would persist using the AMP. Examples of management changes that may be implemented in response to reductions in bird populations or the amounts of bird use of the ponds include changes in the allowable recreational use of the nearby levees and ponds or other habitat enhancements that have been shown to be effective.

Overall, following the implementation of the AMP, the impact of Alternative Mountain View B to dabbling ducks would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C is similar to Alternative Mountain View B with the addition of more breaches in the Pond A1 levees and levee lowering between Pond A1 and Charleston Slough to increase the speed of tidal marsh transition. The same PG&E infrastructure improvements noted for Alternative B would also be made for Alternative C. Alternative C also has minor changes to the habitat transition zones, increased recreational access, improved levees around the southern and western ends of Charleston Slough, and a new location for the water intake for Shoreline Park's sailing lake. Nesting islands and habitat transition zones would still be constructed under Alternative C.

Alternative Mountain View C would result in temporary disturbance to dabbling duck foraging and roosting during the construction of the PG&E infrastructure and other levee improvements that would be similar to but greater-in-extent than the temporary disturbance under Alternative Mountain View B. Under Alternative C, the levee lowering between Charleston Slough and Pond A1 could result in a faster transition to tidal marsh habitat and decrease the mudflat area more quickly. Dabbling ducks are expected to still forage and use the tidal marsh habitat created under Alternative C, but foraging quality may be reduced from what is currently available in the mudflats of Charleston Slough. The habitat islands and habitat transition zones for nesting and roosting and the tidal marsh foraging habitat created under Alternative C would still be expected to benefit dabbling ducks.

Pond-associated foraging habitat for dabbling ducks would decline under Alternative Mountain View B, but tidal marsh and mudflat foraging would improve. Dabbling ducks would also benefit from increased nesting and roosting habitat on the islands and habitat transition zones. Further, the implementation of ongoing monitoring and management actions would persist using the AMP. Examples of management changes that may be implemented in response to reductions in bird populations or the amounts of bird use of the ponds include changes in the allowable recreational use of the nearby levees and ponds or other habitat enhancements that have been shown to be effective.

Overall, following the implementation of the AMP, the impact to dabbling ducks under Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions. The A8 Ponds are managed as subtidal ponds with muted tidal action. Suitable foraging habitat exists at the A8 Pond for dabbling ducks.

No changes to the A8 Pond habitat would take place under Alternative A8 A; therefore, Alternative A would have no impact on dabbling ducks.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be added to the southern interior corners of Pond A8. Current management practices would not change and the overall habitat function for dabbling ducks would be enhanced. A very small amount of pond habitat would be lost at the location of the habitat transition zones, but this loss would be minor relative to the remaining pond habitat. The habitat transition zones could provide nesting and roosting habitat. Therefore, the impact of Alterative B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds. The outboard levees along Ponds R3 and R4 provide inland flood protection and would be maintained or repaired as needed. The ponds are isolated from tidal action and Bay connectivity. The existing seasonal ponds would provide minimal habitat function for dabbling ducks, though ducks may use the ponds during the winter when ponded. Under the No Action Alternative, there would be no impact to dabbling duck habitat.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would transition to tidal marsh habitat, and Ponds R5 and S5 would become enhanced managed ponds. The levee at Pond R4 would be breached at the historic slough to facilitate tidal flows in the pond. A water control structure would be installed at the location of a historic slough at Pond R3, and water control structures would also connect Ponds R5 and S5 to Pond R4 (and indirectly to the Bay) and Flood Slough. A habitat transition zone would be created along Bedwell Bayfront Park, and a portion of levee would be maintained in Ponds R5/S5 for roosting habitat.

The tidal marshes that develop in Pond R4 and the habitat transition zone would provide foraging and nesting habitat for dabbling ducks. Dabbling ducks could also use the managed pond habitat that would be created in Ponds R5 and S5. The actions taken in Alternative Ravenswood B would continue to create a diversified tidal marsh offering shelter and foraging habitat. Therefore, potential impacts to dabbling ducks under Alternative Ravenswood B would be less than significant (CEQA) and beneficial (NEPA).

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be converted to tidal marsh. Actions would be similar to those described for Alternative Ravenswood B except additional habitat transition zones would be created in Pond R4, and Ponds R5 and S5 would be managed as intertidal mudflat habitat. Pond R4 would be connected to Greco Island, and Pond R3 have water control structures added for management. The tidal marshes that develop in Pond R4 and the habitat transition zone would provide foraging and nesting or roosting habitat for dabbling ducks. Dabbling ducks could also use the intertidal mudflat habitat that would be created in Ponds R5 and S5.

Actions taken in Alternative Ravenswood C would continue to create a diversified tidal marsh offering shelter and foraging habitat. Therefore, the impact of Alternative Ravenswood C to dabbling ducks would be less than significant (CEQA) and beneficial (NEPA).

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached and restored to tidal marsh as described for Alternatives Ravenswood B and Ravenswood C. Unlike Alternative C, there would be no connection to Greco Island, but water control structures would still be provided at Ponds R3, R5, and S5, and the habitat transition zones would still be constructed. Alternative D would also include construction to connect Pond S5 with the Bayfront Canal and Atherton Channel to allow flood storage during storm events.

As described above, dabbling ducks would benefit from the creation of tidal marsh habitat and habitat transition zones. Ponds R5 and S5 would be drawn down in the winter, allowing for flood storage from Bayfront Canal during storm events. Plants could grow during these drawdown periods, allowing more forage opportunity for dabbling ducks. Adding stormwater capacity would also decrease the overall salinity of Ponds R5 and S5, which may also promote the growth of plants. Actions taken in Alternative Ravenswood D would continue to create a diversified tidal marsh offering shelter and foraging habitat. Therefore, the impact to dabbling ducks under Alternative Ravenswood D would be less than significant (CEQA) or beneficial (NEPA).

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-17: Potential Impacts to Harbor Seals.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Pacific harbor seals are currently the only marine mammals that are permanent residents of San Francisco Bay. Harbor seals forage in nearshore marine habitats on a variety of fishes and invertebrates. Harbor seals have been observed in restored Phase 1 ponds, including Ponds A6 and A17. Seals may use more than 10 sites around the Bay at any given time (Lidicker and Ainley 2000), and any undisturbed intertidal habitat accessible to the open Bay could potentially be used by harbor seals. Because of the low numbers of areas where large numbers of harbor seals congregate in the South Bay, the disturbance of a primary haul-out or pupping area as a result of SBSP Restoration Project construction would be a significant impact (2007 EIS/R).

In the long term, the project is expected to have a net benefit to harbor seals through enhancement of prey fish populations and the restoration of miles of tidal sloughs and channels that would serve as foraging areas and provide new haul-out sites. Although the effects of the SBSP Restoration Project on harbor seals are expected to be beneficial overall, the AMP includes a description of monitoring and adaptive management activities concerning this species (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Intertidal mudflats would function in the short term in portions of the ponds. As sediment accretion continues, most of the pond interiors would become vegetated, enhancing fish populations.

Harbor seal haul-outs are known at the mouth of Coyote Creek near Calaveras Point (about 2.5 miles from Pond A19) and near Mowry Slough, north of Coyote Creek (approximately 5 miles from the Island

Ponds). Although haul-out spots could be temporarily created at the Island Ponds, this area is not expected to be used by harbor seals due to the distance upstream on Coyote Creek. However, the improved fisheries associated with the restoration of the Island Ponds would improve the foraging habitat for seals in the area. No construction would occur under the No Action Alternative, so there would be no construction impacts to seals. Therefore, the impacts of Alternative Island A to harbor seals would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. As in Alternative Island A, habitat would transition to tidal marsh but with more connectivity to Mud Slough on the north and between Ponds A19 and A20. The same benefits associated with fisheries improvement may also occur in more locations. As under Alternative Island A, harbor seals would not be expected to use the Island Ponds for a haul-out location due to the upstream position of this pond cluster.

With implementation of measures to avoid and minimize impacts (i.e., seasonal avoidance and pre-construction surveys), impacts on harbor seals as part of construction would be expected to be limited and short term (see Phase 2 Impact 3.5-10). Because implementation of the project would result in increased estuarine fish abundance near an existing haul-out, which would improve foraging habitat, the impact of Alternative Island B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Ponds A19 and A20 levees would be lowered. Additional breaches would be constructed along Mud Slough in Ponds A19, A20, and A21, and pilot channels would be dug in Pond A19 to further enhance habitat connectivity and complexity during and after the transition to tidal marsh. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. The impacts and benefits described above for Alternative Island B would apply under Alternative C, except the transition to tidal marsh habitat would occur in more places throughout the Island Ponds.

With implementation of measures to avoid and minimize impacts (e.g., seasonal avoidance and pre-construction surveys), impacts on harbor seals during construction would be expected to be limited and short term (see Phase 2 Impact 3.5-10). Because implementation of the project would result in increased estuarine fish abundance near an existing haul-out, which would improve foraging habitat, the impacts of Alternative Island C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no action would be taken. The Mountain View Ponds would continue to function as managed ponds. There are no seal haul-outs near the Mountain View Ponds. Because no construction would occur and there would be no changes in pond management that would affect nearby resources, harbor seals would not be impacted by Alternative A.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W, which are currently several feet deep, and convert them to tidal marsh and habitat transition zones. Islands for nesting birds would also be constructed. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The breaching of the levees, construction of boardwalks, and the creation of habitat transition zones would require construction activities. Although this disturbance could negatively impact harbor seals, there are no nearby harbor seal haul-outs (the closest haul-out [Calaveras Point] is about 2 miles northeast of the Mountain View Ponds), so harbor seal haul-outs would not be expected to be impacted by construction.

The conversion of the Mountain View Ponds from ponds to tidal marsh would be potentially beneficial for harbor seals through increased estuarine fish abundance in the South Bay. Because of this improvement in foraging habitat and avoidance during construction, the impact of Alternative Mountain View B on harbor seals would be considered to be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W, which are currently several feet deep, and convert them to tidal marsh and habitat transition zones. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C. Also, Alternative C would breach Charleston Slough and lower the levee between Pond A1 and the slough. The actions would serve to improve the connectivity of these ponds with Charleston Slough and help facilitate the slough's transition to tidal marsh. The south and west levees of Charleston Slough would be raised and improved to meet City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

The breaching of the levees and the creation of habitat transition zones would require more construction activities than under Alternative Mountain View B. Although this disturbance could negatively impact harbor seals, there are no nearby harbor seal haul-outs (the Mowry Slough haul-out is several miles northeast of the Mountain View ponds), so harbor seal haul-outs would not be expected to be impacted by construction.

The conversion of the Mountain View Ponds from shallow ponds to tidal marsh would be potentially beneficial for harbor seals because of increased estuarine fish abundance in the South Bay. Because of this improvement in foraging habitat and avoidance during construction, the impact of Alternative Mountain View B on harbor seals would be considered to be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. USFWS would continue to operate and maintain the ponds in accordance with the management practices that have been in place since the implementation of the Phase 1 actions. There are no seal haul-outs near the A8 Ponds. Because no construction would occur and there would be no changes in pond management that would affect nearby resources, harbor seals would not be impacted under Alternative A.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. The construction of the habitat transition zones would require construction equipment, which could potentially impact harbor seals. However, the nearest haul-out area is Calaveras Point, several miles north of these ponds, and this area would not be disturbed during the construction of the habitat transition zones. Therefore, Alternative A8 B would have no impact on harbor seals.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new action would be taken. The ponds would continue to function as seasonal ponds, and the levees would be maintained or repaired as needed. The ponds are isolated from tidal action and are not connected to the bay. Therefore, no impacts to harbor seals would occur under Alternative A.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. The breaching of the levees, construction of a habitat transition zone, and installation of water control structures would require construction equipment, which could potentially impact harbor seals (e.g., noise impacts). However, the nearest haul-out locations, Bair Island and Newark Slough, are 2 to 3 miles away, a distance too far to impact harbor seal haul-out areas. Therefore, no impacts would be expected.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C Pond R4 would be breached along the Ravenswood Slough and along San Francisco Bay, including lowering part of the surrounding levee; Pond R4 would be turned into tidal marsh habitat; and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into tidal mudflats, regulated by water control structures. The breaching and lowering of the levees, construction of habitat transition zones, and installation of water control structures would require construction equipment, which could potentially impact harbor seals (e.g., noise impacts). However, the nearest haul-out locations, Bair Island and near Newark Slough, are 2 to 3 miles away, a distance too far to impact harbor seal haul-out areas. Therefore, no impacts would be expected.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds, and the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows and treat residual salinity in Ponds R5 and S5. Next, the Pond R3 levee would be breached and a water control structure would be added. Also, Alternative Ravenswood D would create habitat transition zones in two locations in Pond R4.

The breaching and lowering of the levees and the creation of the habitat transition zones and installation of water control structures would require construction equipment, which could potentially disturb harbor seals (e.g., noise impacts). However, the nearest haul-out locations, Bair Island and near Newark Slough, are 2 to 3 miles away, a distance too far to impact harbor seal haul-out areas. Therefore, no impacts would be expected.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.5-18: Potential recreation-oriented impacts to sensitive species and their habitats.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Improved recreational access to baylands within the South Bay is an important objective of the SBSP Restoration Project. Increased recreational use and the maintenance of trails and other public access and recreational facilities have the potential to disturb wildlife, result in the trampling of vegetation, decrease nesting success, increase predation, increase the introduction of non-native species, and decrease habitat quality. Ultimately, such impacts could result in decreases in the abundance of breeding, foraging, and roosting wildlife (2007 EIS/R).

Potential Phase 2 impacts include:

- Human disturbance of nesting birds can result in abandonment of nests and chicks, resulting in decreased reproductive success and increased predation, particularly of eggs and young. Disturbance of foraging and roosting may decrease the effectiveness or increase the stress of these activities. The trails and viewing platforms that are part of the Phase 2 alternatives all have some potential to increase these types of disturbance of the various bird species and guilds discussed in the rest of the impacts listed in this section.
- California Ridgway's rails along levee trails may be subject to higher predation risk because they may avoid high cover along levees during high tides (instead swimming within the flooded marsh or using areas of sparser cover) due to human presence on the levee. Disturbance of rails could potentially lead to abandonment of nests and chicks, resulting in decreased reproductive success (Overton 2007).
- Levee-top trails through marsh may impede the movement of Ridgeway's rail or salt marsh harvest mouse populations between current and future restored tidal marsh habitats because of human disturbance and lack of vegetative cover.

- Nesting western snowy plovers may also be adversely affected by increased human use of the SBSP Restoration Project area. Disturbance could lead to reduced egg viability or nest abandonment, particularly if disturbance causes plovers to remain off the nest for more than a few minutes. Recreation could have these same effects on other nesting birds, such as stilts, avocets, and terns.
- Increased recreational use of levee trails could potentially reduce habitat quality in managed ponds for nesting, roosting, and foraging waterbirds. Although some species and individuals habituate to human activity, others would maintain some distance between areas they select for nesting, foraging, or roosting and trails or viewing platforms. The intervening distance is essentially unused by these individuals, reducing the actual extent of habitat available.
- Hunting is allowed during certain seasons in some of the Refuge pond areas. Of the Phase 2 pond complexes, the A8 Ponds and the Ravenswood Ponds allow hunting. Hunting from a boat is allowed at Island Pond A19. There is no hunting at the Mountain View Ponds themselves, but the adjacent ponds to the east do allow hunting. Hunting is managed, permitted, and controlled by the Refuge to minimize impacts on wildlife, but the potential for disturbance even to species not being hunted exists.
- There is no expectation that the recreational activities associated with this project could result in impacts to other wildlife species, such as fish or small mammals, approaching the level of significance (2007 EIS/R).

Recent studies on the impacts of recreational trails on bird species suggest that waterbirds, shorebirds, and western snowy plover would all be impacted by the addition of new trails near foraging and nesting habitats (Trulio et al. 2012a; Trulio et al. 2012b; Trulio et al. 2013). Recommendations from the studies suggest that new trails should be sited at least 100 to 165 feet away from shorebird foraging habitat, and new trails should be adjacent to wide rather than narrow borrow ditches where possible (Trulio et al. 2013). Trails should be located at least 500 feet away from western snowy plover nesting habitat (Trulio et al. 2012a), and should be at least 400 feet away from waterfowl foraging habitat (Trulio et al. 2012b). Also, a study of nests on islands created at Pond SF2 suggests that the islands created greater than 300 feet from trails and 600 feet from viewing platform were not significantly affected by recreational access, though recreational use of the Pond SF2 trail has been low (Ackerman et al. 2014).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no additional recreation access would be planned. There are no walking trails in the Island Ponds. Boating in the adjacent sloughs is allowed, but boating is prohibited within the ponds. Therefore, the impact would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, no recreation access is planned. Boating in the adjacent sloughs is allowed, but boating is prohibited within the ponds. Although breaching of pond levees may increase the potential for illegal boating within restored ponds, the benefits of tidal restoration to tidal marsh species would outweigh any adverse effects from disturbance associated with increased boating. Breaching of levees may help reduce land-based trespass in this area as well. Therefore, the impact would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, no recreation access is planned. Boating in the adjacent sloughs is allowed, but boating is prohibited within the ponds. Although breaching of pond levees may increase the potential for illegal boating within restored ponds, the benefits of tidal restoration to tidal marsh species would outweigh any adverse effects from disturbance associated with increased boating. Breaching of levees may help reduce trespass in this area as well. Therefore, the impact would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no additional recreation access is planned. The Mountain View Ponds would continue to function as managed ponds. Existing trails would continue to be maintained.

Under the No Action Alternative, there would be no new impacts to sensitive species and their habitats from recreation-orientated activities.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B proposes two trail improvements in the southern portion of Pond A1. The first improvement would be a spur trail leading to a viewing platform on a levee between Charleston Slough and Pond A1. The second improvement would be a viewing platform installed on an existing trail at the southern end of Pond A1.

Impacts from these trail improvements would be expected to be minor. The spur trail would extend less than 1,000 feet onto the improved levee between the intertidal Charleston Slough and the restoring tidal marsh in Pond A1. This area is already a heavily used recreation area, as Charleston Slough’s intertidal mudflats draw many bird-watchers and many people use these trails for exercise. All trails and viewing platforms would be confined to the existing levees. Nesting islands that would be constructed under Alternative B would be located away from trails and viewing platforms to limit disturbance to nesting birds (more than 300 feet from trails and 600 feet from viewing platforms). This distance is greater than the distance used for Pond SF2, which was previously restored and does not appear to have been significantly affected by new recreational access (Ackerman et al. 2014). The viewing platform would be installed along an existing trail that also receives heavy visitation.

Increased recreational access resulting from Phase 2 activities may impact sensitive species and their habitats. However, such disturbance would likely be limited to relatively narrow corridors along the edges of the ponds where trails get added or improved. Further, these effects would be monitored and managed, and implementation of the AMP would ensure that impacts do not reach significant levels. Public access has considerable potential to result in long-term benefits to sensitive species in the South Bay by improving public education concerning the importance of the SBSP Restoration Project and habitat restoration and South Bay conservation in general. Such education and public enjoyment of the South Bay’s biological resources may be important in maintaining public support for adequate funding for future phases of restoration and long-term monitoring and management of SBSP Restoration Project-area habitats. With monitoring and implementation of the AMP, the impact of recreation would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C contains the same public access features as Alternative Mountain View B, with several additional improvements. The first improvement would be a reconstructed Bay Trail segment along the improved south and west levees of Charleston Slough with a spur trail and viewing platform on the remaining levee projecting into Charleston Slough. The second trail improvement would be a new trail constructed using the PG&E access road, along the eastern edge of Pond A2W. This trail would lead to a viewing platform located on the northern end of Pond A2W.

The reconstructed Bay Trail west of Charleston Slough would make use of an existing trail. Trail use could theoretically increase once improvements have been made, but because this trail is already being heavily used for recreation, disturbance to sensitive wildlife is not expected to significantly increase. The new trail and observation platform on the east levee of Pond A2W would allow for recreational use in an area not previously accessible for recreational use. This trail would likely decrease waterfowl foraging and roosting within 400 feet of the trail (Trulio et al. 2012b). As the habitat transitions from pond to mudflat to tidal marsh, the species impact would also shift. When providing mudflat foraging habitat for shorebirds, this new trail is expected to reduce foraging within 165 feet of the trail (Trulio et al. 2013). Due to the large area of Pond A2W, these impacted foraging bands would be relatively small compared to the total pond area. However, there is currently a trail on an adjacent levee across Stevens Creek/Whisman Slough. Also, the ponds adjacent to Pond A2W are open to hunting, making Ponds A1 and A2W especially important to roosting and foraging waterfowl.

Impacts may also include disturbance to wildlife seeking high-tide roosting habitat and disturbance of nesting habitat along the levees. To limit disturbance to nesting birds, constructed nesting islands would be at least 300 feet from trails and 600 feet from viewing platforms and dogs would not be allowed on the trail or any other access features that would be placed inside of the Refuge. This distance is greater than the distance used for Pond SF2, which was previously restored and does not appear to have been significantly affected by new recreational access (Ackerman et al. 2014). There are currently nesting islands along the eastern edge of Pond A2W that contain nesting colonies of Forster’s tern and American avocet. These islands will remain in place, and new islands would be built. Although new islands could be built farther from disturbances, the existing islands are very close to the levee and could well be abandoned if this trail is open to recreation.

Increased recreational access resulting from Phase 2 activities may impact sensitive species and their habitats. Due to the importance of maintaining undisturbed nesting and roosting sites within the project area, such disturbance would likely be limited to those relatively narrow corridors along the edges of the ponds where trails get added or improved. Further, these effects would be monitored and managed, and the AMP would be implemented. In particular, under Alternative Mountain View C, the locations that are most likely to experience disturbance by recreational use of public access features are along the eastern levee of Pond A2W, where the new public access trail would be added, and around Charleston Slough, particularly the southern end, where trails and viewing platforms would be added. Use of these newly added features is not expected to lead to a significant impact on sensitive wildlife species, but it cannot be ruled out, though it will be monitored and addressed if need be. If monitoring reveals disturbance levels that are greater than those anticipated by this Final EIS/R, the Refuge managers would use the AMP to develop and implement modifications to these access features, including gates on the bridges over A2W's levee breaches to allow that trail to be seasonally closed, modifying the Refuge’s current policies on hunting, or make other adjustments as needed.

The benefits of public access in the form of public support and funding for restoration, as described above, would offset impacts associated with the new recreation features. With monitoring and implementation of the AMP, the impact of recreation would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no additional recreation access is planned. The A8 Ponds would continue to function as managed subtidal ponds with muted tidal action. Although trails are adjacent to the A8 Ponds, no trails exist within the A8 Ponds. Under the No Action Alternative, there would be no new impacts to sensitive species and their habitats from recreation-orientated activities.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, no additional recreation access is planned. The A8 Ponds would continue to function as managed subtidal ponds with muted tidal action. Although trails are adjacent to the A8 Ponds, no trails exist within the A8 Ponds. Under Alternative B, there would be no new impacts to sensitive species and their habitats from recreation-orientated activities.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no additional recreation access is planned. The Ravenswood Ponds would continue to function as managed seasonal ponds. There are no existing trails in the Ravenswood Ponds. Existing trails adjacent to the Ravenswood Ponds are in Bedwell Bayfront Park, which is owned by the City of Menlo Park. These trails would continue to be used and maintained separately. Under the No Action Alternative, there would be no new impacts to sensitive species and their habitats from recreation-orientated activities.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, a viewing platform would be constructed on an existing trail near Ponds R5 and S5 to provide a public education benefit. This action would enhance existing recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park. Because habitat surrounding the area where the viewing platform would be installed is highly disturbed by recreational activities at Bedwell Bayfront Park, it is expected that the addition of the viewing platform would result in minimal impacts to sensitive species and their habitats.

Increased recreational access resulting from Phase 2 activities may impact sensitive species and their habitats. However, these effects would be monitored and managed, and implementation of the AMP would ensure that impacts do not reach significant levels. Public access has considerable potential to result in long-term benefits to sensitive species in the South Bay by improving public education concerning the importance of the SBSP Restoration Project and habitat restoration and South Bay conservation in general. Such education and public enjoyment of the South Bay’s biological resources may be important in maintaining public support for adequate funding for future phases of restoration and long-term monitoring and management of SBSP Restoration Project area habitats. With monitoring and implementation of the AMP, the impact of recreation would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C contains the same public access improvements mentioned for Alternative Ravenswood B with two additional trail improvements. The first improvement would be a new spur trail on an elevated boardwalk extending from an existing Bedwell Bayfront Park trail to a proposed viewing platform on the northern edge of Pond R4. The second improvement would be a new trail along the eastern levees of Ponds R5 and S5 that would be linked to the existing Bay Trail spine just outside of the Refuge boundary to the south of these ponds. This trail would form a loop around Ponds R5 and S5. A fence would also be installed along Pond R3 to limit disturbance by dogs and humans to western snowy plover.

Recreational access has the potential to result in disturbance of roosting, nesting, and foraging birds. However, such disturbance would likely be limited to relatively narrow corridors along the edges of the ponds where trails get added or improved. The loop trail offers access to inner levees adjacent to Pond R3. Pond R3 contains suitable snowy plover habitat that could be disturbed by these trails. It is expected the disturbance would be confined to the western edge of Pond R3, adjacent to the proposed trail. However, given that snowy plovers are expected to be nesting at higher densities in Pond R3 after Pond R4 becomes tidal, the proposed new trail access along this border of Pond R3 would have further potential impacts on nesting success. Depending on the level of disturbance it causes, this loop trail could cause a significant impact on various sensitive wildlife species.

In addition, the spur trail on the boardwalk at the northwest corner of Pond R4, extending outward toward the Bay, could indirectly limit (because of disturbance) the movement of sensitive species between the existing tidal marsh at Greco Island and the newly forming tidal marsh along Pond R4. That would limit the effectiveness of this habitat for sensitive species, including California Ridgway's rail and salt marsh harvest mouse; it is unlikely this would rise to the level of a significant impact, but it is possible. At both of these sites, the impacts from recreational users may be further exacerbated if dog-walkers at Bedwell Bayfront Park do not obey the rules about keeping dogs out of the Refuge, even if they are on-leash.

Thus, the increased recreational access resulting from Phase 2 activities may impact sensitive species and their habitats at both of the proposed trail and boardwalk options featured in Alternative Ravenswood C. To further reduce this risk, using the AMP, bird flushes will be monitored in association with recreational use. If monitoring reveals disturbance levels that are greater than those anticipated by this Final EIS/R, the Refuge managers would use the AMP to develop and implement modifications to these access features, including seasonal closures of entry gates onto the boardwalk trail at Pond R4, modifying the R5/S5 loop trail so that it is only a spur trail and doesn't completely surround the ponds, and adding additional signage or adding other adjustments as needed.

Therefore, these effects would be monitored and managed, and the AMP would be implemented as described. The benefits of public access in the form of public support and funding for restoration, as described above, would offset the impacts associated with the new recreation features. With monitoring and implementation of the AMP, the impact of recreation would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, the same public access and recreational improvements as listed in Alternative Ravenswood C would be installed. The difference is that a trail, rather than a boardwalk, would be installed along the northwest levee of Pond R4 near Greco Island. No further additional recreation access would be planned.

Under Alternative Ravenswood D, impacts to sensitive species and their habitats from recreation-orientated activities would be very similar to those listed for Alternative Ravenswood C. The loop trail around Ponds R5 and S5 would be the same in this alternative as in Alternative Ravenswood C, and would have the same degrees and types of possible impacts. The same monitoring and response options – including seasonal closure, gates, and conversion to a spur trail –described above would remain available for implementation if monitoring conducted under the AMP determined that disturbance-related impacts were greater than anticipated.

Under Alternative Ravenswood D, however, the spur trail at the northwest corner of Pond R4 would be on a levee instead of on an elevated boardwalk. This would present a physical barrier to salt marsh harvest mouse dispersal and increase the potential effects of disturbance on sensitive wildlife species. This dynamic could limit the effectiveness of this habitat for sensitive species, including California Ridgway's rail and salt marsh harvest mouse, though this disturbance is not expected to rise to the level of a significant impact.

Thus, the increased recreational access resulting from Phase 2 activities may impact sensitive species and their habitats at both of the proposed trail options featured in Alternative Ravenswood D. To further reduce this risk, using the AMP, the Refuge staff will actively monitor wildlife, including but not limited to monitoring bird flushes in association with recreational use. If monitoring reveals disturbance levels or other impacts on wildlife that are greater than those anticipated by this Final EIS/R, the Refuge managers would use the AMP to develop and implement modifications to these access features. This modifications could include seasonal closures of entry gates onto the trail at Pond R4, converting that trail to an elevated boardwalk, modifying the R5//S5 loop trail so that it is only a spur trail and doesn't completely surround the ponds, and adding additional signage or adding other adjustments as needed.

The benefits of public access in the form of public support and funding for restoration, as described above, would offset the impacts associated with the new recreation features. With monitoring and implementation of the AMP, the impacts of recreation would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-19: Potential Impacts to special-status plants.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

No threatened or endangered plants are known or expected to occur in the SBSP Restoration Project area. No special-status plants have been documented within the boundaries of the Ravenswood pond complex (CNDDB 2014). Congdon's tarplant was recorded adjacent to Stevens Creek in 2002, in Alviso, and at the Sunnyvale Baylands Park not far south of Pond A8 (CNDDB 2006). These last two areas are near but not within the SBSP Restoration Project area (2007 EIS/R). Because no ESA-listed plants are known to occur within the impact areas for the SBSP Restoration Project, no adverse impacts to ESA-listed plants are expected.

Small spikerush (*Eleocharis parvula*; also known as dwarf spikerush) was identified on the levees surrounding the Island Ponds (herbarium specimens were submitted to UC JEPS herbarium by the SCVWD in 2012). Although this species is not federally or state listed as threatened or endangered, it has been identified as a watch list species (CRPR 4.3) (CNPS 2015). CNPS and its partner agencies recommend considering impacts to these species until more information regarding their abundance and taxonomy is known. Possible impacts to this species are discussed in the section on the Island Ponds, below.

In the long term, the SBSP Restoration Project is expected to improve conditions for most of the special-status plants listed above as well as others that occur primarily in upper tidal marsh habitat. Habitat transition zones would be created at the upper edge of some marshes by importing fill to produce broad, gently sloping areas adjacent to flood control levees or adjoining upland habitat. These unique marsh-associated habitats, including the habitat transition zones and natural salt panne areas within upper salt marshes, require thoughtful restoration design. These habitat transition zones represent an important habitat type largely absent from the South Bay and would provide the opportunity for the re-introduction of special-status plant species. Also, tidal habitat restoration could eventually include the development of mature tidal marsh features (e.g., shell ridges, microtopographic differences) that could support special-status plant species (2007 EIS/R).

In the event that special-status plant species are discovered during surveys, the following avoidance and minimization measures would be implemented to eliminate any significant impact of the project on these plant species: (1) special-status plant species would be avoided to the maximum extent feasible, and all special-status plant populations would be clearly marked and avoided during construction; (2) if avoidance of special-status plant species populations is not feasible, several different actions could take place. For plant-containing areas that would be temporarily affected, the plants and the surrounding soil would be collected, re-deposited in a nearby area, and then replaced following construction. For plant-containing areas that would be permanently impacted, the plants and the surrounding soil would be collected and relocated adjacent to impacted areas in suitable habitat. Whether special-status plants would colonize restored tidal and transitional habitats on their own or would have to be introduced to these areas is unknown, but the overall project impacts on special-status plants have the potential to be beneficial (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Currently, no threatened or endangered plant species are known to occur in the area of the Island Ponds. However, a watch list species (CRPR 4.3), small spikerush, was identified on the surrounding levees. Because there would be no action under Alternative Island A, there would be no impact to this species.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19’s levees would be breached, and the breaching, removal, and lowering of levees would create some temporary disturbance and small amounts of levee habitat loss. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Currently, no threatened or endangered plants species are known to occur in the Island Ponds. However, a CRPR 4.3 species, small spikerush, does occur in the area. It is on the levee shoreline of Pond A19 and on exposed mud flat in three separate patches nearby (Santa Clara Valley Water District 2014). A breach in these areas could adversely affect these plants. To reduce potential impacts to this species, before construction, the population of small spikerush would be mapped and avoided if possible (e.g., by relocating the breach or not lowering that portion of the levee). Some individual plants might be relocated if necessary and feasible. Because this species is not an ESA-listed species, no additional mitigation is proposed. Pre-construction surveys would be conducted before the start of construction to ensure that there are no additional species present. Also, implementation of the project would result in substantial increases in tidal marsh habitat, potentially creating new habitat for special-status marsh plants.

With implementation of measures to avoid and minimize impacts (e.g., pre-construction surveys, occurrence mapping), the impact of Alternative Island B to special-status plants would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Additional breaches would be made in Ponds A19, A20, and A21. The breaching, removal, and lowering of levees would create some temporary disturbance and small amounts of levee habitat loss. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Impacts and benefits associated with restoration under Alternative C would be the same as those under Alternative Island B except in more locations; more area would thus be disturbed as part of construction. As above, to reduce impacts to small spikerush, before construction, the populations would be mapped and avoided if possible (e.g., by relocating the breach or not lowering that portion of the levee). Some individuals might be relocated if necessary and feasible.

Also, implementation of the project would result in substantial increases in tidal marsh habitat, potentially creating new habitat for some special-status plants. With implementation of measures to avoid and minimize impacts (e.g., pre-construction surveys, occurrence mapping), the impact of Alternative Island C to special-status plants would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no action would be taken. The Mountain View Ponds would continue to function as managed ponds. No threatened or endangered plants species are known to occur in the vicinity of the Mountain View Ponds. Therefore, no impacts to existing special-status plants would be expected to occur from the No Action Alternative.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would involve breaching Ponds A1 and A2W, which are currently shallow ponds, and converting them to tidal marsh and habitat transition zones. Alternative B would also create habitat islands within Ponds A1 and A2W. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers. No threatened or endangered plants species are known to occur in the vicinity of the Mountain View Ponds. Therefore, no impact to special-status plants would be expected to occur under Alternative B.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. Alternative Mountain View C would also involve breaching Ponds A1 and A2W, which are currently shallow ponds, and converting them to tidal marsh and habitat transition zones. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C. Also, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and raise and improve the south and west levees of Charleston Slough to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. Alternative C would also create habitat islands within Ponds A1 and A2W. No threatened or endangered plant species are known to occur in the vicinity of the Mountain View Ponds. Therefore, no impacts to special-status plants would be expected to occur under Alternative C.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no action would be taken. The A8 Ponds would continue to function as managed subtidal ponds with muted tidal action. No threatened or endangered plants species are known to occur in the area of the A8 Ponds. Therefore, no impact to existing rare plants would be expected to occur from the No Action Alternative.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. The construction of the habitat transition zones would require construction-related disturbance. No threatened or endangered plants species are known to occur in the area of the A8 Ponds. Therefore, no impact to existing rare plants would expected to occur from Alternative A8 B.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no action would be taken. The Ravenswood Ponds would continue to function as managed seasonal ponds. No threatened or endangered plants species are known to occur in the vicinity of the Ravenswood Ponds. Under Alternative Ravenswood A, no action would take place. Therefore, no impact to special-status plants would be expected to occur under Alternative A.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structures would be added at Pond R3 to enhance its habitat quality. The breaching of the levees, installation of water control structures, and placement of material for habitat transition zones would result in construction-related disturbance. Currently, no threatened or endangered plants species are known to occur in the area of the Ravenswood Ponds. Therefore, no impact to special-status plants would be anticipated under Alternative B.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and San Francisco Bay, including lowering part of the surrounding levee; Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into tidal mudflats regulated by water control structures. Water control structures would be added at Pond R3, and habitat transition zones would be created. The breaching of the levees, installation of water control structures, and placement of material for habitat transition zones would result in construction-related disturbance. Currently, no threatened or endangered plants species are known to occur in the area of the Ravenswood Ponds. Therefore, no impact would be anticipated under Alternative C.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal Project would allow the ponds to be operated to temporarily detain peak stormwater flows and address residual salinity in Ponds R5 and S5. A water control structure would be added at Pond R3. Also, Alternative D would create habitat transition zones in two locations in Pond R4. All of these construction activities would result in construction-related disturbance. Currently, however, no threatened or endangered plants species are known to occur in the area of the Ravenswood Ponds. Therefore, no impact would be anticipated under Alternative D.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.5-20: Colonization of mudflats and marsh plain by non-native Spartina and its hybrids.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

There is concern that the restoration could provide new substrate for the spread of smooth cordgrass, a highly invasive plant species, and its hybrids formed with native Pacific cordgrass. Smooth cordgrass and its hybrids are considered one of the three most significant invasive-species threats to San Francisco Bay (Grossinger et al. 1998) and a cause of significant concern for restoration managers. Restoration sites on salt ponds offer unvegetated areas where seedlings can grow unhindered by competition and often in conditions sheltered from wave action. Given these ideal circumstances for establishment, smooth cordgrass and its hybrids are likely to rapidly colonize restored salt ponds (Ayres et al. 2004) and become a dominant plant species in the restored tidal marshes if it is not controlled (2007 EIS/R).

Intentional and unintentional breaching of levees and subsequent increases in tidal habitat could inadvertently help spread non-native *Spartina*, resulting in a potentially significant impact. However, the SBSP Restoration Project expects that invasive Spartina would largely be controlled by the Invasive Spartina Project before implementation of the SBSP Restoration Project and eradicated if it establishes after implementation. The Invasive Spartina Project has been successful in reducing the total extent of patches of established invasive *Spartina* from over 800 acres to fewer than 30 acres. The size of the infestation in each of the remaining sites has also been diminishing. By 2014, 41 sites had less than 1 square meter of coverage by the non-native and the hybrid, and 49 sites were between 1 square meter and 1 acre. Ongoing control and eradication efforts have been shown to be possible and effective as long as adequate funding and staffing for the program are provided; unmaintained sites have rebounded very quickly, in as little as 1 year. This emphasizes the critical importance of the Invasive Spartina Project and its ongoing funding and support for staffing and other operations.

Thus, impacts under all alternatives are expected to be less than significant, even while acknowledging that invasive plants cannot be completely and permanently eradicated in all locations. The SBSP Restoration Project is using the Invasive Spartina Project's 2010 Best Management Practices document (presented in Appendix K) to plan restoration and management efforts. The list of practices is as follows:

1. Do not plant non-native *Spartina* at any time
2. Verify genetics of native *Spartina* plantings
3. Do not plant native *Spartina* where it may become pollinated by hybrid *Spartina*
4. Monitor and remove
5. "Success" = "No non-native *Spartina*"
6. Do not open a new marsh (i.e., make the tidal connection) too near *Spartina alterniflora* or *S. alterniflora* hybrids
7. Clean equipment
8. Avoid potentially contaminated dredged material

The most relevant of these to the SBSP Restoration Project are numbers 4, 6, 7, and 8, because these would minimize the risk of spreading invasive *Spartina* and its hybrids into the restoration areas.

At a minimum, the 2007 EIS/R stated that the project would clean equipment and supplies to prevent the spread of seeds and plant material of non-native *Spartina* and other invasive plants during construction, restoration, and maintenance activities (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Because these ponds have been opened to tidal action, intertidal mudflats would function in the short term. In the long term, most of the mudflats would become vegetated as sediment accretion continues.

The potential uncontrolled nature of levee breaching or failure under the No Action Alternative could lead to locations and timing of tidal restoration that temporarily increase colonizable land in areas where control is difficult due to access. However, with time, *Spartina* colonization is expected to be controlled by the Invasive Spartina Project. Monitoring and management of changes in abundance of smooth cordgrass and its hybrids in the SBSP Restoration Project area are described in the AMP. With the AMP, which will be implemented under all alternatives, and in collaboration with the Invasive Spartina Project, *Spartina* would be monitored and controlled to reduce impacts to a less-than-significant level.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19's levees would be breached. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Breaching of the levees and subsequent creation of mudflats would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. However, the project would implement the AMP and continue to collaborate with the Invasive Spartina Project to monitor and control smooth cordgrass and its hybrids. With these practices in place, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Breaches would be constructed along Mud Slough in all three ponds. Also, the existing southern breaches on Pond A19 would be expanded and pilot channels would be constructed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Compared with the other alternatives, Alternative C would bring the largest and most sudden changes from current habitat conditions, which would increase the potential area for invasive *Spartina* to colonize and could be a significant impact. However, the project would implement the AMP and continue to collaborate with the Invasive Spartina Project to monitor and control smooth cordgrass and its hybrids. With these practices in place, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). With Alternative Mountain View A (the No Action Alternative), no action would be taken. The Mountain View Ponds would continue to function as managed ponds. The potential uncontrolled nature of levee breaching under the No Action Alternative could lead to locations and timing of tidal restoration that are counterproductive to the efforts of the Invasive Spartina Project. Also, the lack of monitoring under the No Action Alternative would increase the burden on existing eradication efforts in identifying potential areas of concern. Therefore, if invasive *Spartina* is not controlled by the Invasive Spartina Project, impacts resulting from Alternative A could be significant. However, the project has an AMP in place that describes the process by which changes in the abundance of smooth cordgrass and its hybrids in the SBSP Restoration Project area would be monitored and the adaptive management efforts may be implemented in response to the monitoring. Therefore, with the AMP in place, and in collaboration with the Invasive Spartina Project, the impact of Alternative A would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh and habitat transition zone. Alternative B would also create habitat islands and habitat transition zones within Ponds A1 and A2W. The levee between Pond A1 and Charleston Slough would be improved as well. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers.

The breaching of the levees and the subsequent development of mudflats would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. However, the project would implement an AMP, described above, to monitor and control smooth cordgrass and its hybrids. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh and habitat transition zone. The same PG&E infrastructure improvements noted for Alternative Mountain View B would be made for Alternative C. Also, Alternative Mountain View C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levees south and west of Charleston Slough to increase connectivity across all of the ponds and to facilitate the transition of Charleston Slough to tidal marsh habitat. Alternative C would also create habitat islands and habitat transition zones within Ponds A1 and A2W. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

The breaching of the levees and subsequent creation of mudflats would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. However, the project would implement an AMP, described above, to monitor and control smooth cordgrass and its hybrids. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native Spartina would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no action would be taken. The A8 Ponds would continue to function as managed subtidal ponds with muted tidal action. The project has an AMP in place that describes the process by which changes in the abundance of smooth cordgrass and its hybrids in the SBSP Restoration Project area would be monitored and the adaptive management efforts that may be implemented in response to the monitoring. Therefore, with the AMP in place, and in collaboration with the Invasive Spartina Project, there would be no impact under Alternative A.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. Alternative B could create larger bands of additional habitat for invasive *Spartina* to colonize than currently exist. However, should invasive *Spartina* be found within the A8 Ponds, the project would implement an AMP, as described above, to monitor and control non-native *Spartina*. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native Spartina would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no action would be taken. The ponds would continue to function as seasonal ponds, and the levees would be maintained or repaired as needed to provide flood protection. Because these ponds are not open to the Bay and the levees would be maintained, limiting the potential for unintentional breaching, no impact would be associated with Alternative A.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be restored to tidal marsh habitat and the AAC levee would be fortified. A habitat transition zone would be built in Pond R4. Also, Ponds R5 and S5 would be turned into enhanced managed ponds, and a water control structure would be installed at Pond R3.

The breaching of the levees and subsequent development of mudflats would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. Hybrid *Spartina* is located in adjacent marshes and waterways, including Greco Island, Bair Island, and Ravenswood Slough. Unless these marshes are free of the hybrids before breaching, the Ravenswood Ponds are likely to be immediately invaded on breach. However, the project has an AMP in place that describes the process by which smooth cordgrass and its hybrids would be eliminated from nearby areas before restoration. The AMP also describes how changes in abundance in the SBSP Restoration Project area would be monitored and the adaptive management efforts might be implemented in response to monitoring. Also, the AMP describes how to prevent colonization by smooth cordgrass and its hybrids from reaching a level of significance. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and breached along San Francisco Bay, including lowering part of the surrounding levee; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into tidal mudflats regulated by water control structures. Water control structures would also be put on Pond R3 and a habitat transition zone would be created in Pond R4.

As described for Alternative Ravenswood B, breaching of the levees and subsequent development of mudflats under Alternative Ravenswood C would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. However, the project would implement an AMP, as described above, to monitor and control invasive cordgrass. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds, and the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows. Water control structures would be installed at Pond R3. Also, Alternative D would create habitat transition zones in two locations in Pond R4.

As described for Alternative Ravenswood B, the breaching of the levees and subsequent development of mudflats would increase the potential area for invasive *Spartina* to colonize, which would be a significant impact. However, the project would implement an AMP, as described above, to monitor and control invasive cordgrass. With the AMP in place, and in collaboration with the Invasive Spartina Project, colonization of mudflats and marsh plain by non-native *Spartina* would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-21: Colonization by non-native Lepidium.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

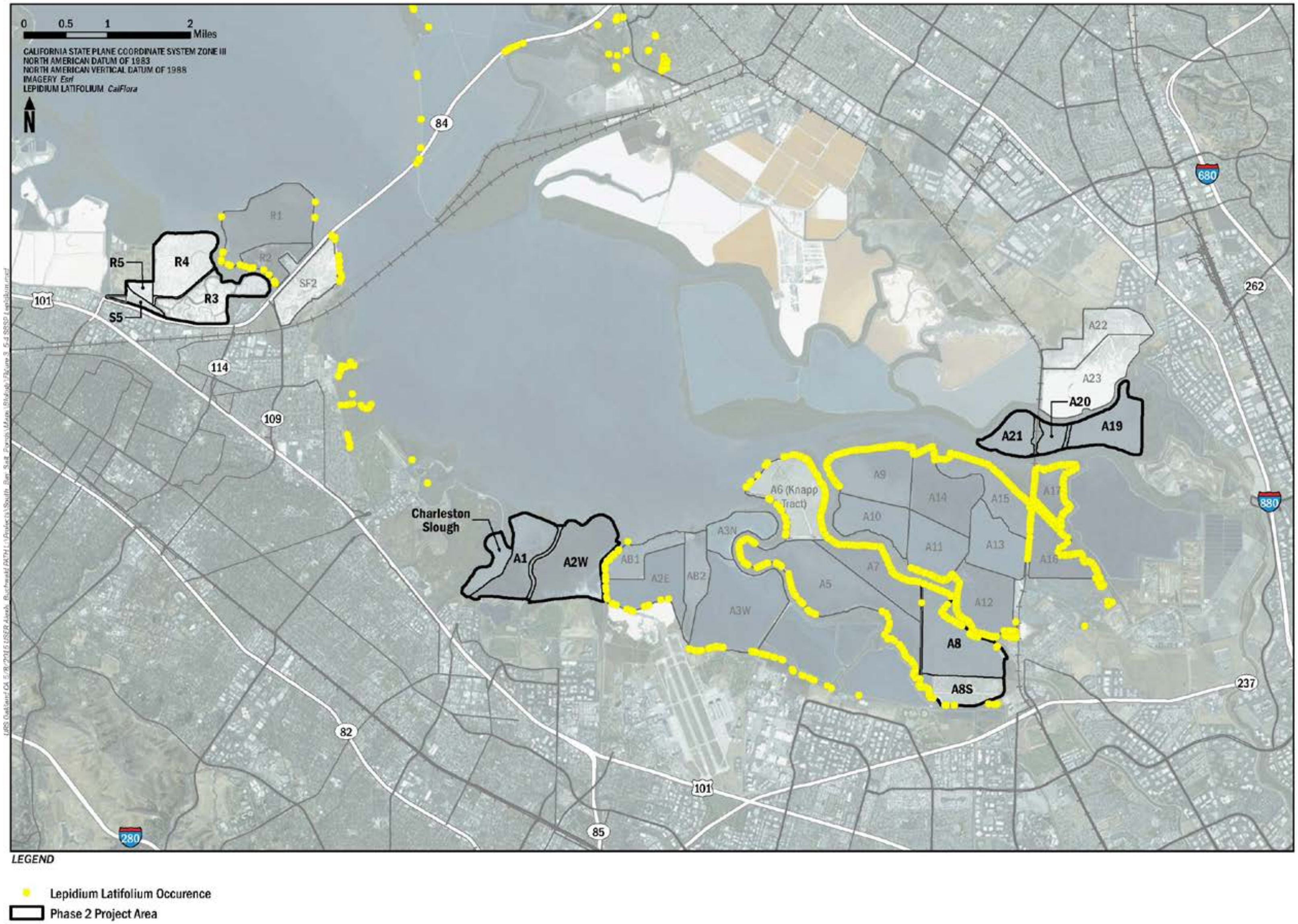
Because *Lepidium* colonization occurs primarily in infrequently flooded, brackish marshes, it competes for resources with native brackish-marsh species such as bulrushes (2007 EIS/R). Figure 3.5-4 illustrates the known distribution of *Lepidium latifolium* in the South Bay. *Lepidium* may have effects on the species composition within marsh areas. Without tidal restoration in the far South Bay (i.e., the Alviso pond complex), continued sedimentation may result in increased colonization by the non-native perennial pepperweed (*Lepidium latifolium*) as the tidal prism continues to decrease and brackish marsh expands.

Conversely, the breaching of levees and subsequent increases in tidal prism could reduce the amount of brackish marsh habitat available for colonization by *Lepidium*, and importance of eradication and control programs by the Refuge and project partners. This would be a benefit. Because *Lepidium* only grows in a narrow brackish band, the restored tidal marshes will almost entirely self-limit the areas where *Lepidium* could grow. This would be a second form of benefit.

However, the large areas of created habitat transition zone would also provide new areas for potential *Lepidium* colonization (2007 EIS/R). On these habitat transition zones, ongoing eradication and control will be critical, as will active revegetation with native plants immediately after construction to resist initial *Lepidium establishment*. There is a risk of extensive *Lepidium* establishment on these habitat features if not properly controlled. All of the habitat transition zones being considered for Phase 2 action alternatives are readily accessible to staff from shore, so it would be feasible to perform the necessary eradication and control.

The Best Management Practice of cleaning equipment and supplies to prevent the spread of seeds and plant material of non-native *Lepidium* and other invasive plants would be implemented during construction and restoration activities and during maintenance activities such as driving on levees and mowing (2007 EIS/R).

Figure 3.5-4. *Lepidium latifolium* occurrences in the South Bay



Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Because these ponds have been opened to tidal action, intertidal mudflats would develop in the short term. In the long term, most of the mudflats would become vegetated as sediment accretion continues.

Currently, large stands of *Lepidium* are present along adjacent Mud Slough and Coyote Creek. During the transition to tidal marsh, *Lepidium* could become established, particularly along the margins of new channels that develop within the ponds. The AMP, discussed in the 2007 EIS/R, addresses monitoring and control of *Lepidium* colonization. The implementation of the AMP would reduce this impact to less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19's levees would be breached on Mud Slough. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative B, habitat would still transition to tidal marsh but with increased habitat connectivity relative to the baseline and to Alternative Island A.

The breaching of the levees could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. However, should *Lepidium* colonization take place in the new tidal areas, the AMP, discussed in the 2007 EIS/R, would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Additional breaches on Mud Slough would be constructed in all three ponds. Also, the existing southern breaches on Pond A19 would be expanded and pilot channels would be constructed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative C, habitat would still transition to tidal marsh, but with increased habitat connectivity relative to the baseline and to Alternatives Island A and Island B.

The breaching of the levees could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. However, should *Lepidium* colonization take place in the new tidal areas, the AMP, discussed in the 2007 EIS/R, would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no action would be taken. The Mountain View Ponds would continue to function as managed ponds. Currently, *Lepidium* is visible on aerial images of tidal marsh areas adjacent to the Mountain View Ponds. Under the No Action Alternative, no new construction or changes in management would occur; therefore, there would be no impact on existing populations of *Lepidium*.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W, which are currently ponds several feet deep, and convert them to tidal marsh with islands and habitat transition zones. Alternative B would improve the levee between Pond A1 and Charleston Slough.

The breaching of the levees could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. Later, as this reaches equilibrium, there would be places for *Lepidium* to establish. Alternative B would also create upland habitat for *Lepidium* on the habitat islands, in the habitat transition zones, and on the improved levee sections. However, should *Lepidium* colonization take place in the new tidal or habitat transition zone areas, the AMP discussed in the 2007 EIS/R would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh and habitat transition zones. In addition, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levees south and west of Charleston Slough to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. Alternative C would also create habitat islands within Ponds A1 and A2W.

The breaching of the levees could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. Alternative Mountain View C would also create upland habitat for *Lepidium* on the habitat islands, in the habitat transition zones, and on the improved levee sections. However, should *Lepidium* colonization take place in the new tidal or upland areas, the AMP, discussed in the 2007 EIS/R, would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no action would be taken. The A8 Ponds would continue to function as managed subtidal ponds with muted tidal action. Currently, large stands of *Lepidium* are present within or in proximity to the A8 Ponds (such as in the Alviso Slough upland and transition areas). With the No Action Alternative, no construction or change in management would occur; therefore, there would be no impact to *Lepidium* populations as a result of Alternative A.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. The habitat transition zones would be potentially colonizable by *Lepidium* stands, which would be a potentially significant impact. This potential impact would be reduced through the AMP, which would reduce this impact to a less-than-significant level.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new action would be taken. The ponds would continue to function as seasonal ponds, and the levees would be maintained or repaired as needed to provide flood protection. These ponds are not open to the Bay, and under Alternative A no new action would be taken, and no impact to *Lepidium* populations would be expected.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along Ravenswood Slough, part of the levee near Greco Island would be lowered, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structure would be installed on Pond R3. A habitat transition zone would be added in Pond R4 along Bedwell Bayfront Park.

The breaching of the levees at Pond R4 could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. Alternative Ravenswood B would also create upland habitat for *Lepidium* in the established habitat transition zone and along the improved levee of the AAC. The introduction of tidal water carrying *Lepidium* seeds into Ponds R5/S5 could also increase the potential for colonization on the island levee retained in Pond R5/S5. However, should *Lepidium* colonization take place in the new tidal or upland areas, the AMP, discussed in the 2007 EIS/R, would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and along San Francisco Bay near Greco Island, including lowering part of the surrounding levee; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Water control structures would be installed on Pond R3. Also, Ponds R5 and S5 would be turned into tidal mudflats regulated by water control structures. Habitat transition zones would be created along the AAC levee and adjacent to Bedwell Bayfront Park.

The breaching of the levees at Pond R4 could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization.

Alternative C would also create upland habitat for *Lepidium* in the habitat transition zones and along the improved levee of the AAC. There is also potential for *Lepidium* to colonize the mudflat area in Pond R5/S5. However, should *Lepidium* colonization take place in the new tidal or upland areas, the AMP, discussed in the 2007 EIS/R, would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows. Water control structures would be installed on Pond R3. Also, Alternative D would create habitat transition zones in two locations in Pond R4.

The breaching of the levees at Pond R4 could potentially open new areas for colonization. As new channels form, *Lepidium* could colonize the channel margins. This colonization could be partially offset by the increased tidal prism, which could scour banks and reduce the potential for colonization. Alternative D would also create upland habitat for *Lepidium* in the habitat transition zones. However, should *Lepidium* colonization take place in the new tidal or upland areas, the AMP discussed in the 2007 EIS/R would be implemented to address the colonization. The implementation of the AMP would reduce this impact to a less-than-significant level.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-22: Increase in exposure of wildlife to avian botulism and other diseases.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

Of the wildlife diseases that could potentially affect species in the South Bay, those affecting birds are of greatest concern because of the ease with which they may be transmitted (due to birds' mobility) and the large numbers of individuals that can potentially be exposed to diseases in flocks or colonies. Avian botulism, the avian disease with the greatest potential to affect large numbers of birds, is caused by a toxin produced by the bacterium *Clostridium botulinum*. This pathogen requires a protein source, warm temperatures, and anoxic or low-oxygen conditions to reproduce and is generally harbored by soil in the environment (USGS 1999). Warm, shallow water, fluctuating water levels, high ambient temperatures, the presence of vertebrate and invertebrate carcasses, high nutrient levels, and rotting vegetation can contribute to the presence of *C. botulinum* (Washburn 2013). Botulism is a neurological disease that results in paralysis, often leading affected birds to show symptoms that include an inability to fly or to hold their heads above water (2007 EIS/R).

Monitoring for botulism has occurred in the South Bay since at least 1982. Since then, avian botulism has been linked to six large waterbird die-offs and some smaller outbreaks. The largest recent outbreak was in 1998 when over 1,400 birds were affected in San Jose and Sunnyvale (SFBBO 2012). Permanently flooded marshes often have higher concentrations of botulism compared to seasonally flooded marshes. The presence of dead animals, pesticides, and other nutrient inputs that lead to algae blooms and warm, brackish water with low levels of dissolved oxygen increases the potential for botulism. Water pollution control plants have been identified as likely contributors to botulism outbreaks (SFBBO 2012). The 2007 EIS/R identified the following proposed mechanisms that facilitate outbreaks of avian botulism in the South Bay:

- The sludge-bed theory, which suggests that botulism outbreaks occur as a result of the warm and often anaerobic conditions created in the sludge ponds and lagoons associated with water treatment plant facilities;
- The microenvironment theory, which suggests that shallow ponds of water, formed from mudflats temporarily isolated from water exchange during low tide, facilitate outbreaks because they are associated with invertebrate die-offs, which are often consumed in large quantities by foraging birds; or
- The bird carcass theory, which suggests that botulism outbreaks are caused by the spread of bacteria through infected carcasses as maggots and invertebrates ingest the bacteria and are then ingested by foraging birds.

The SBSP Restoration Project could potentially exacerbate existing occurrences of diseases, particularly avian botulism, if the project were to increase the incidence of conditions such as warm water temperatures and anoxic or low-oxygen conditions. Such conditions may be present in shallow managed ponds with poor water circulation, necessitating careful management of water circulation; marshes that are poorly drained may also harbor such conditions. The AMP includes a description of monitoring and adaptive management activities concerning water quality. The project could also potentially increase the occurrence of disease outbreaks by concentrating larger numbers of birds into smaller areas (e.g., fewer ponds) (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Future gradual levee erosion and degradation would increase circulation and decrease conditions that are suitable for avian botulism.

The developing tidal marshes are not expected to harbor conditions that are conducive to avian botulism due to the tidal exchange that will keep warm pools from establishing. Under the No Action Alternative, there would be no increase in the exposure of wildlife to avian botulism and other diseases.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19’s levees would be breached on Mud Slough. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative B, habitat would still transition to tidal marsh but with additional habitat connectivity and circulation, which could improve the baseline condition.

The tidal marsh habitat created under Alternative Island B is not expected to provide conditions suitable for avian botulism. Under Alternative B, there would be no increase in exposure of wildlife to avian botulism and other diseases.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Additional breaches on Mud Slough would be constructed in all three ponds. Also, the existing southern breaches on Pond A19 would be expanded and pilot channels would be constructed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative C, habitat would still transition to tidal marsh, but with even more habitat connectivity and circulation than under Alternative Island B, which could improve the baseline condition.

The tidal marsh habitat created under Alternative Island C is not expected to provide conditions suitable for avian botulism. Under Alternative C, there would be no increase in exposure of wildlife to avian botulism and other diseases.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds.

The No Action Alternative would maintain the managed low-salinity ponds in their current state. Pond A2W is managed for water quality, which involves circulating water as needed to control dissolved oxygen per the existing AMP. Under the No Action Alternative, there would be no increase in exposure of wildlife to avian botulism and other diseases.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh. Alternative B would also create habitat islands and habitat transition zones within Ponds A1 and A2W. The same PG&E infrastructure improvements discussed elsewhere would also be made in Alternative B.

Selective breaching along historic slough meanders would encourage adequate water circulation, thus reducing conditions that are conducive to avian botulism. The restored tidal habitats are not expected to foster wildlife diseases. As a result, Alternative B would have no new impacts on outbreaks of avian botulism.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh. Alternative B would also create habitat islands and habitat transition zones within Ponds A1 and A2W.The same PG&E infrastructure improvements discussed elsewhere would also be made in Alternative C. In addition, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levee south and west of Charleston Slough to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance.

Alternative Mountain View C would also create habitat islands within Ponds A1 and A2W. These actions would increase overall connectivity and circulation between the two ponds and Charleston Slough. Selective breaching along historic slough meanders would encourage adequate water circulation, thus reducing conditions that are conducive to avian botulism. The restored tidal habitats are not expected to foster wildlife diseases. As a result, Alternative C would have no new impacts on outbreaks of avian botulism.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. USFWS would continue to operate and maintain the muted tidal ponds in accordance with ongoing management practices.

The muted tidal habitats at the A8 Ponds are not expected to provide conditions conducive to an avian botulism outbreak. If the water-control structures in the system are closed for long periods, to provide flood storage capacity, they would be closed only during the winter wet season. High-temperature, low-oxygen conditions that favor avian botulism would not be present during this season, and it is therefore unlikely that the system would provide conditions favorable for an outbreak. Under the No Action Alternative, there would be no increase in the exposure of wildlife to avian botulism and other diseases.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. Under Alternative A8 B, impacts related to wildlife exposure to avian botulism and other diseases would be similar to the impacts described for the No Action Alternative. Current pond management practices would be the same as those described for the No Action Alternative. Under Alternative B, there would be no increase in the exposure of wildlife to avian botulism and other diseases.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds, and levees would be maintained or repaired as needed. The ponds are isolated from tidal action and Bay connectivity.

The existing seasonal ponds at the Ravenswood Ponds are not expected to provide conditions conducive to an avian botulism outbreak. The ponds are currently dry in the warm summer months, filling only after winter rains. Under the No Action Alternative, there would be no increase in exposure of wildlife to avian botulism and other diseases.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Ravenswood Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structure would be installed on Pond R3. A habitat transition zone would be established in Pond R4 adjacent to Bedwell Bayfront Park.

The tidal marshes that develop in Pond R4 are expected to provide high-quality marsh habitat with adequate circulation of water to avoid low-oxygen conditions. This condition would be achieved by breaching the levee on the historic slough meander and cutting a pilot channel into the historic slough to encourage water circulation. Water circulation in the subtidal habitat in Ponds R5 and S5 would be managed by two water control structures that would link Ponds R5 and S5 to Flood Slough and to Pond R4. Conditions in Pond R4 are not expected to be conducive to avian botulism, and water in Ponds R5 and S5 would be monitored and controlled; therefore, the impact of Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and breached and lowered along San Francisco Bay near Greco Island, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Water control structures would be installed on Pond R3 that would allow increased circulation, as needed. Also, Ponds R5 and S5 would be turned into enhanced managed ponds designed and operated to simulate intertidal mudflats and regulated by water control structures. Habitat transition zones would be created along the AAC levee and adjacent to Bedwell Bayfront Park.

The tidal marshes that develop in Pond R4 are expected to provide high-quality marsh habitat with adequate circulation of water to avoid low-oxygen conditions. This condition would be achieved by breaching the levee on the historic slough meander and cutting a pilot channel into the historic slough to encourage water circulation. The additional breaches and water control gates would facilitate daily water circulation in Ponds R5 and S5—and increased circulation when needed in Pond R3—to avoid the low-oxygen conditions associated with avian botulism outbreaks. Conditions under Alternative Ravenswood C are not expected to be conducive to avian botulism, and water in Ponds R5 and S5 would be monitored and controlled; therefore, there would be little to no increase in exposure of wildlife to avian botulism and other diseases. The impact of Alternative Ravenswood C would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. The installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows and address residual salinity in Ponds R5 and S5. Water control structures would be installed on Pond R3 that would allow increased circulation, as needed. Also, Alternative Ravenswood D would create habitat transition zones in two locations in Pond R4.

Impacts would be similar to those of Alternative Ravenswood B, with the main exception being the stormwater connection into Ponds R5 and S5. Peak stormwater runoff from large storms would be allowed to be temporarily diverted into Ponds R5 and S5. Water control structures would be used to manage water circulation in Ponds R5 and S5. Conditions in Pond R4 are not expected to be conducive to avian botulism, and water in Ponds R5 and S5 would be monitored and controlled. Therefore, the impact of Alternative Ravenswood D would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.5-23: Potential impacts to bay shrimp populations.

Potential program-level impacts are addressed in Chapter 3.6 of the program-level evaluation found in the 2007 EIS/R. Here, the project-level impacts of the implementation of Phase 2 are assessed.

The epifaunal invertebrate community in the South Bay is dominated by several species of shrimps and crabs. Two native caridean shrimps, the California bay shrimp and the blacktail bay shrimp (*C nigricauda*), are common in tidal sloughs and in the Bay itself. The California bay shrimp supports the only commercial fishery remaining in the South Bay aside from the limited harvest of brine shrimp that occurs in salt ponds. The 2007 EIS/R cited unpublished data valuing the brine shrimp harvest of approximately 75,000 pounds at between $154,000 and $312,000 per year at that time. No additional data on this fishery was identified during the preparation of this document. A discussion of California bay shrimp life cycle details can be found in the 2007 EIS/R.

At a program level, the SBSP Restoration Project is expected to have a net benefit on bay shrimp by increasing (to Bay levels) the salinities in some freshwater sloughs and channels in the South Bay and increasing the amount of estuarine habitat. Such habitat is likely to be especially important to bay shrimp as nurseries for juveniles. However, some managed ponds (e.g., those managed specifically for small shorebirds) may have higher salinity and lower DO levels than some existing ponds. Releases of water from these ponds when conditions are not optimal could result in localized areas of low DO and high salinity that may impair the health of, or cause mortality of, bay shrimp. Overall, the project has the potential to enhance the shrimp populations, which in turn could also provide economic benefits by revitalizing the shrimping industry. Although the effects of the SBSP Restoration Project on bay shrimp are expected to be beneficial overall, the AMP includes a description of monitoring and adaptive management activities concerning water quality and releases to the Bay (2007 EIS/R).

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh.

Bay shrimp may use tidal sloughs within the marsh as nurseries. Under the No Action Alternative, bay shrimp are expected to benefit from the increase in tidal habitat that would occur due to the natural transition to tidal marsh habitat at the Island Ponds. Therefore, the impact of Alternative Island A would be less than significant under CEQA and beneficial under NEPA.

Alternative Island A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19's levees would be breached on Mud Slough. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative B, habitat would continue to transition to tidal marsh, but with more habitat connectivity than under the baseline condition or Alternative A.

Bay shrimp may use tidal sloughs within the restored marsh as nurseries. Under Alternative Island B, bay shrimp would be expected to benefit from the increase in tidal habitat. Therefore, the impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Island B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Additional breaches on Mud Slough would be constructed in all three ponds. Also, the existing southern breaches on Pond A19 would be expanded and pilot channels would be constructed. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. Under Alternative C, habitat would continue to transition to tidal marsh, but with more habitat connectivity than under the baseline condition or Alternatives Island A or Island B.

Bay shrimp may use tidal sloughs within the restored marsh as nurseries. Under Alternative Island C, bay shrimp are expected to benefit from the increase in tidal habitat. Therefore, the impact of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Island C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds, and levees would be maintained for inland flood protection.

Low water quality in discharges could potentially adversely affect bay shrimp. Under the No Action Alternative, there would be no change in the discharges compared to the baseline condition. Therefore, there would be no new impacts on bay shrimp as a result of Alternative A.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W and convert them to tidal marsh and add habitat transition zone. Alternative B would also create habitat islands within Ponds A1 and A2W. PG&E infrastructure improvements would add a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raise and improve the existing boardwalk within Pond A2W, and add concrete to expand the footings around the bases of the transmission towers. Selective breaching along sloughs leading to Stevens Creek and Permanente Creek would improve foraging habitat for juvenile shrimp migrating up to the brackish water of these tidal estuaries. Multiple breaches in Ponds A1 and A2W would provide water circulation in the newly restored marshes, thus avoiding low-oxygen conditions. Tidal marsh habitat adjacent to sloughs would provide suitable low-salinity brackish estuarine habitat for juvenile shrimp migrating to summer foraging grounds.

The Action Alternatives for the Mountain View Ponds are expected to benefit to bay shrimp by increasing the amount of tidal marsh habitat. Such habitat is likely to be especially important as nurseries for juveniles. Therefore, the impact of Alternative B would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W and convert them to tidal marsh and add habitat transition zone. Also, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levees south and west of Charleston Slough to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made for Alternative C. Alternative C would also create habitat islands within Ponds A1 and A2W. These actions would facilitate the transition to tidal marsh in Charleston Slough.

Shallow waters in Charleston Slough may currently provide some habitat for shrimp. Although some shallow ponded mudflat habitat would be lost under Alternative Mountain View C, the conversion to tidal marsh and the development of tidal sloughs and smaller channels would be expected to have a net benefit on shrimp nursery habitat. The benefits of Alternative C are similar to those described for Alternative Mountain View B, except that the benefit would be greater because more tidal marsh habitat would be available with the inclusion of Charleston Slough. Therefore, the impact of Alternative C would be less than significant under CEQA and beneficial under NEPA.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. USFWS would continue to operate and maintain the muted tidal ponds in accordance with ongoing management practices that have been in place since the implementation of the Phase 1 actions. No changes to the habitat of the A8 Ponds would take place under Alternative A and the ponds would continue to be managed in the same manor. Therefore; there would be no new impacts to bay shrimp.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be created in the southern portions of the A8 Ponds. Current management practices would not change. Overall habitat function and pond water management would be the same as described in the No Action Alternative. There may be short-term impacts to a small number of bay shrimp if they were present in the ponds during the construction of the habitat transition zones; however, this impact would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would be maintained in their current condition. The ponds would continue to function as seasonal ponds, and levees would be maintained. The ponds are isolated from tidal action and Bay connectivity. The existing seasonal ponds provide minimal habitat function for bay shrimp. Under the No Action Alternative, there would be no change in impacts to bay shrimp populations.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Ravenswood Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structure would be installed on Pond R3. A habitat transition zone would be established in pond R4 adjacent to Bedwell Bayfront Park

The tidal marshes that would develop in Pond R4 are expected to be beneficial for bay shrimp by providing increased areas of estuarine foraging habitat. The subtidal ponds in Ponds R5 and S5 would be managed to maintain water quality levels. Low DO levels would be avoided and water would be circulated through these ponds. The Ravenswood Action Alternatives would be expected to have a net beneficial effect on bay shrimp due to tidal marsh restoration. Implementation of measures to avoid low DO conditions, including monitoring and adaptive management, would be expected to minimize the potential for the water quality problems associated with discharges from managed ponds. Therefore, the impact of Alternative Ravenswood B would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and breached and lowered along San Francisco Bay near Greco Island, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Water control structures would be installed on Pond R3. Also, Ponds R5 and S5 would be enhanced managed ponds designed and operated to simulate intertidal mudflats and regulated by water control structures. Habitat transition zones would be created along the AAC levee and adjacent to Bedwell Bayfront Park.

The tidal marshes that would develop in Pond R4 would be expected to have beneficial effects on bay shrimp by providing foraging habitat. Ponds R5 and S5 would be managed to mudflat habitat. The Ravenswood Action Alternatives are expected to have a net beneficial effect on bay shrimp due to tidal marsh restoration. Therefore, the impact of Alternative Ravenswood B would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. The installation of water control structures and a connection to the Bayfront Canal and Atherton Channel Project would allow the ponds to be operated to temporarily detain peak stormwater flows and address residual salinity in Ponds R5 and S5. Water control structures would be installed on Pond R3. Also, Alternative Ravenswood D would create habitat transition zones in two locations in Pond R4.

The tidal marshes that would develop in Pond R4 are expected to have beneficial effects on bay shrimp by providing foraging habitat. The subtidal ponds in Ponds R5 and S5 would be managed to maintain water quality levels. Low DO levels would be avoided by circulating water through these ponds using the water control structures connecting Ponds R5 and S5 to Flood Slough and Pond R4.

The Ravenswood Action Alternatives would be expected to have a net beneficial effect on bay shrimp due to tidal marsh restoration. Implementation of measures to avoid low DO conditions, including monitoring and adaptive management, would be expected to minimize the potential for water quality problems associated with discharges from managed ponds. Therefore, the impact of Alternative Ravenswood D would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-24: Potential impacts to jurisdictional wetlands or waters.

Jurisdictional wetlands and non-wetland waters of the United States (WUS) and of the State of California occur at all project ponds (URS 2014). The areas meeting the regulatory definition of "Waters of the U.S." (jurisdictional waters, including wetlands) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. In San Francisco Bay, these areas are also regulated by the BCDC. Also, they are subject to Section 401 of the Clean Water Act, administered in the State of California by the RWQCB, which also has jurisdiction over waters of the State. The project ponds are in the San Francisco RWQCB region.

Regionally, more than 90 percent of historic tidal wetlands in the Bay Area have been lost to diking, draining, and filling (Goals Project 1999). The jurisdictional wetland and water habitats included in the South Bay are open waters and subtidal habitats to the upper reaches of tidal action, the tidal and nontidal wetlands, and former salt evaporation ponds adjacent to the Bay. These habitats provide important wildlife habitat (as discussed in sections above), but also provide other services such as flood protection, water quality improvements, and carbon sequestration.

Most of the Phase 2 project alternatives involve levee breaching to open ponds to take tidal flows. The overarching mission of the project is the restoration and enhancement of tidal marsh wetlands in the South San Francisco Bay while providing for flood management and wildlife-oriented public access and recreation. To achieve these goals, the Phase 2 alternatives would initially create impacts to wetlands and WUS resulting from breaches to the levees and the surrounding fringing marshes. Additional fill-related impacts would come from building islands and habitat transition zones, installing water control structures, and adding or making improvements to the PG&E maintenance infrastructure. However, the impacted acreage would be significantly smaller than the area of the restored wetlands.

The majority of waters conversion would be from non-wetland waters (WUS) to wetlands, which the USACE considers special aquatic sites; special aquatic sites have increased value due to their increased ecological functions and values. The wetlands, in comparison to WUS, will provide higher-quality habitat for sensitive plant and animal species and refugia for many bird species. As described in Chapter 2, habitat transition zones (relatively gently sloping areas) between the ecosystems of the ponds and the uplands at the top of the pond levees. The transition zones are immediately beneficial habitat to wildlife as high tide refugia, and also provide resilience to future sea-level rise by allowing new marsh to gradually move up-slope as tidal elevations increase.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Compared to the baseline condition, there would be a decrease in water habitat and an increase in vegetated marsh habitat over time. The loss of waters habitat would be replaced by high-value wetland habitat. This impact would be considered less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, two additional breaches would occur in Pond A19, levees would be lowered in two areas, and levees would be removed along the western side of Pond A19 and the eastern side of Pond A20. Alternative B would impact jurisdictional wetlands both temporarily (due to disturbance during construction) and permanently (loss of wetland habitat along breached levees). Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would constitute fill in jurisdictional waters, but that fill would be converting non-wetland waters to wetland waters, so there would be no net loss of water from this action. Further, the breaching efforts would lead to the enhanced connectivity during and after the conversion of mudflats to tidal marsh areas. Also, the removal and breaching of levees (i.e., converting upland levees to waters) would create more wetlands and waters than would be impacted. The loss of waters habitat would be replaced by high-value wetland habitat. This impact would be considered less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. Additional breaches on Mud Slough would be constructed in all three ponds. Also, the existing southern breaches on Pond A19 would be expanded and pilot channels would be constructed. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would constitute fill in jurisdictional waters, but it would be converting non-wetland waters to wetland waters, so there would be no net loss of waters from that action. Under Alternative C, habitat would continue to transition to tidal marsh, but with more habitat connectivity than under Alternative Island B.

These construction efforts would likely impact jurisdictional wetlands and waters as described for Alternative Island B, but impacts related to fill and excavating channels through wetlands would be greater because there are more of these types of constructed elements. As above, levee removal and breaching would create more wetlands and waters than would be impacted. The loss of waters habitat would be replaced by high-value wetland habitat. This impact would be considered less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. The Mountain View Ponds would continue to function as managed ponds, and levees would be maintained for inland flood protection. There would be no new impacts associated with Alternative A.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W, and convert them to tidal marsh and add habitat transition zone. Alternative B would also create habitat transition zones and habitat islands within Ponds A1 and A2W. PG&E infrastructure improvements would include adding a new section of boardwalk in an existing marsh just north of Pond A1's bayside levee, raising and improving the existing boardwalk within Pond A2W, and adding more concrete footings around the bases of the transmission towers. All of these would be fill in jurisdictional waters.

The breaching of the levees and the creation of upland areas would impact wetlands, both temporarily (disturbance during construction) and permanently (loss of wetland habitat along breached levees). Wetlands and waters would be impacted during construction as fill is added for the creation of the habitat transition zones and island habitat and as levees are breached. Overall, the construction activities would result in the creation of significantly more wetlands than would be impacted. The loss of waters habitat would be replaced by high-value wetland habitat. This impact would be considered less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W and convert them to tidal marsh and add habitat transition zone. In addition, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levee south and west of Charleston Slough to meet the City of Mountain View requirements. A water intake for Shoreline Park's sailing lake would be added to the levee between Pond A1 and Charleston Slough; the intake would be at the breach. The associated pumps and other utilities would be modified as needed for access and maintenance. Alternative C would also create habitat islands within Ponds A1 and A2W. These actions would facilitate the transition of Charleston Slough to tidal marsh. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C. All of these actions, except those that are on the crest of the levee (e.g., trail improvements and some intake structure improvements) would be fill in jurisdictional waters.

The breaching of the levees and the creation of upland areas would impact wetlands, both temporarily and permanently, as described for Alternative Mountain View B. The impacts of Alternative Mountain View C would be greater than under Alternative B due to more and larger construction elements (e.g., additional breaches, the larger levee footprint south and west of Charleston Slough.). Overall, the construction activities would result in the creation of significantly more wetlands than would be impacted. The loss of waters habitat would be replaced by high-value wetland habitat. This impact would be considered less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. Therefore, no impacts to jurisdictional waters would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create upland transition zones in the southern portions of the A8 Ponds. The construction of the upland transition zones would fill areas that are jurisdictional non-wetland waters of the U.S. This action would be considered an impact related to fill in jurisdictional waters. Overall, jurisdictional waters in Pond A8 would be decreased; however, the losses would be of non-wetland WUS that are already modified by Phase 1 activities. Further, the habitat transition zones would provide a more natural transition between the remaining waters and the adjacent uplands, providing enhanced habitat functions and values. Therefore, the impact of filling small amounts of non-wetland waters in Pond A8S would be considered less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new action would be taken. Therefore, no impacts to jurisdictional wetlands or waters would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat; and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structure would also be installed on Pond R3. The breaching and lowering of the levees would impact wetlands and non-wetland waters. Further, all breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would constitute fill in jurisdictional waters. All of these actions would be fill in jurisdictional waters. However, the conversion of form salt production ponds to tidal marsh would result in a substantial increase in wetland habitat. This impact would be considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough and breached and lowered along San Francisco Bay near Greco Island; Pond R4 would be turned into tidal marsh habitat; and the AAC levee would be fortified. Also, habitat transition zones would be created along the western and southern edges of Pond R4. In addition, Ponds R5 and S5 would be modified and managed to simulate intertidal mudflats and would be regulated by water control structures. Water control structures would also be installed on Pond R3.

The breaching and lowering of the levees and the creation of habitat transition zones would impact jurisdictional wetlands and other waters. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would constitute fill in jurisdictional waters. Although the areas impacted would mostly be jurisdictional non-wetland waters, some wetlands would also be filled. However, the overall conversion of Pond R4 to tidal marsh and Ponds R5 and S5 to tidal mudflats would substantially increase wetland and water habitat. Therefore, this impact would be considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal Project would allow the ponds to be operated to temporarily detain peak stormwater flows. Water control structures would also be installed on Pond R3. Also, Alternative D would create habitat transition zones in two locations in Pond R4.

The breaching and lowering of the levees and the creation of habitat transition zones would impact jurisdictional wetland and other waters. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations. This action would constitute fill in jurisdictional waters. Although the areas impacted would mostly be jurisdictional non-wetland waters, some wetlands would also be filled. However, the overall conversion of Pond R4 to tidal marsh and Ponds R5 and S5 to managed pond habitat would substantially increase wetland and water habitat. Therefore, this impact would be considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.5-25: Potential construction-related loss of, or disturbance to nesting raptors (including burrowing owls).

Raptors, including burrowing owls (*Athene cunicularia*), are known to occur in and near the project ponds. The project ponds and the surrounding bay habitat provide foraging, roosting, and nesting habitat. Suitable nesting habitat for many raptors can include trees, telephone and electrical towers and lines, cliffs, and structures such as buildings or bridges. Burrowing owls are ground nesters and may use burrows (often created by ground squirrels or other rodents) in levees and open upland habitat for nesting. Northern harriers also nest on the ground in higher areas within marsh habitats, grasslands, or fields.

Burrowing owls are also present in ruderal habitats and grasslands (all now non-native) in scattered areas surrounding the South Bay salt ponds and marshes. Ruderal habitats, which are particularly extensive on former landfills (e.g., Bayfront Park and in Sunnyvale, Shoreline Park, and adjacent to A8), and grasslands, agricultural lands, and pastures in the Mountain View, Alviso, Fremont, and Newark areas provide foraging habitat for large numbers of diurnal raptors, such as red-tailed hawks, northern harriers, white-tailed kites (*Elanus caeruleus*), loggerhead shrikes (*Lanius ludovicianus*), peregrine falcons, and American kestrels (*Falco sparverius*). Many of these raptors are found foraging in wetlands, such as salt marshes and managed ponds as well.

Once nests are built in these locations, raptors can be very sensitive to disturbance, such as from construction equipment. Breaching of levees could reduce habitat availability along levees. No impacts to tall nesting structures, such as electric line poles, or trees, are anticipated as part of the Phase 2 projects. Some raptors may benefit from increased prey in the number of other nesting birds or small rodents that could be present on islands, habitat transition zones, or tidal marshes.

Raptors are protected under the federal Migratory Bird Treaty Act and some are protected under the Endangered Species Act of 1973. Raptors, including burrowing owls, are also protected under state law (see Fish and Game Code Sections 3503, 3503.5, 3505, and 3513 and Title 14 California Code of Regulations Sections 251.1, 652, and 783–786.6). Burrowing owls are known to inhabit burrows within SBSP Restoration Project levees adjacent to A2W; other raptors are known to nest in power poles proximate to the area of the SBSP Restoration Project that could be disturbed by construction activity.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no new action would be taken. Levees breached in 2006 would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Therefore, no impact to nesting raptors would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, the levees separating Ponds A19 and A20 would be removed and the northwestern and southwestern portions of the Pond A19 levees would be lowered. Pond A19's levees would be breached along Mud Slough. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

Construction of the levee breaches and the lowering and removal of levees could potentially impact nesting raptors through noise and visual disturbance. To minimize this impact, work would be done outside of the nesting season to the extent possible. If work were to occur during the nesting season, pre-construction surveys would be conducted to identify any nesting raptors within 500 feet of the project construction areas (or an agency-approved distance); burrowing owl surveys would follow the CDFW protocol, as provided in *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Should any nesting raptors be identified, nest locations would be recorded, and an agency approved buffer would be established for working in the area. If construction cannot be timed to avoid nesting raptors and they are identified during pre-construction surveys, a biological monitor would be present to monitor disturbance to any nesting birds. With the implementation of these measures, the impact of Alternative B to nesting raptors would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, the levees separating Ponds A19 and A20 would be removed and significant portions of the Pond A19 and Pond A20 levees would be lowered. All of the ponds would be breached along Mud Slough. All breached or excavated material would be sidecast into deeper portions of the ponds to raise bottom elevations.

Potential impacts to nesting raptors would be the same as under Alternative Island B, except the duration of construction could be longer under Alternative C because it has more constructed elements. The avoidance and minimization measures described for Alternative B would be applied to reduce impacts to nesting raptors. With the implementation of these measures, the impact of Alternative C to nesting raptors would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no new action would be taken. Therefore, no impacts to nesting raptors would occur.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach Ponds A1 and A2W and convert them to tidal marsh and habitat transition zone. Alternative B would also create habitat islands and add habitat transition zones within Ponds A1 and A2W. A new recreation trail and viewing platform would be created in the southwestern corner of Pond A1.

PG&E maintains electrical towers that run through the project area. These towers provide potential nesting or roosting habitat for raptors. The PG&E infrastructure improvements under Alternative Mountain View B would include adding a new section of boardwalk in an existing marsh just north of

Pond A1's bayside levee, raising and improving the existing boardwalk within Pond A2W, and adding more concrete footings around the bases of the transmission towers.

Construction of the levee breaches and islands could potentially impact nesting raptors through noise and visual disturbance. Construction work on the PG&E infrastructure could similarly disturb raptors. The proposed recreation trail at the southwest corner of Pond A1 is not expected to significantly impact nesting raptors because it is near an area already being used for recreation and not near suitable nesting habitat. The existing burrowing owl habitat in nearby Shoreline Park would not be physically affected, but there could be noise-related disturbances to these owls when fill material is brought into the project staging areas.

To minimize this impact on nesting raptors, work would be done outside of the nesting season to the extent possible. If work were to occur during the nesting season, pre-construction surveys would be conducted to identify any nesting raptors within 500 feet of the project construction areas (or an agency-approved distance); burrowing owl surveys would follow the CDFW protocol, as provided in *Staff Report on Burrowing Owl* (CDFG 2012). In addition, the City of Mountain View keeps updated records of burrows and nests each year and can provide them to the SBSP Restoration Project as part of a refined planning and routing plan as construction approaches. Should any nesting owls or other raptors be identified within the construction area or along the haul routes, the nest locations would be recorded, and an agency-approved buffer zone would be established for working in the area. The haul routes to import the necessary fill material will be selected to avoid the locations of that year's raptor nests and associated buffers to the extent feasible. If construction cannot be timed to avoid nesting raptors and they are identified during pre-construction surveys, a biological monitor would be present to monitor disturbance to any nesting birds. With the implementation of these measures, the impact of Alternative Mountain View B to nesting raptors would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would also breach Ponds A1 and A2W, which are currently shallow ponds, and convert them to tidal marsh and add habitat transition zone. Also, Alternative C would breach Charleston Slough, lower the levee between Pond A1 and Charleston Slough, and fortify the levees south and west of Charleston Slough. In addition, Alternative C would create habitat islands within Ponds A1 and A2W. New recreation trails would be created in the southwestern corner of Pond A1 and around the eastern side of Pond A2W. The same PG&E infrastructure improvements noted for Alternative Mountain View B would also be made in Alternative C.

The impacts from construction would be the similar to those proposed under Alternative Mountain View B, except they would be greater due to the additional constructed elements. The south and west levees around Charleston Slough would be raised and improved, creating more potential disturbance to raptors. Construction work on the PG&E infrastructure could disturb raptors. Also, the recreation trail along the eastern edge of Pond A2W could disturb and impact raptors nesting in the PG&E towers. The adjacent levee across Stevens Creek also has a popular public access trail, so there could be larger effects. However, this impact is considered less than significant due to the physical barriers to public entry to the PG&E boardwalks and towers and the presence of other suitable nesting habitat in the area. The known burrowing owl habitat in nearby Shoreline Park would not be physically affected, but there could be noise-related disturbances to these owls when fill material is brought into the project staging areas.

The avoidance and minimization measures described for Alternative Mountain View B would be applied to reduce impacts to nesting raptors. With the implementation of these measures, the impacts to nesting raptors would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no new action would be taken. Therefore, no impacts to nesting raptors would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B proposes to create habitat transition zones in the southern portions of the A8 Ponds. Depending on the texture of the soil material used, the habitat transition zone could potentially provide nesting habitat for burrowing owls, which would be a potentially beneficial impact. However, the construction of the habitat transition zone would include disturbance associated with construction equipment, and the noise from construction could potentially impact nesting raptors, which would be a significant impact.

To minimize this impact, work would be done outside of the nesting season to the extent possible. If work were to occur during the nesting season, pre-construction surveys would be conducted to identify any nesting raptors within 500 feet of the project construction areas (or an agency-approved distance); burrowing owl surveys would follow the CDFW protocol, as provided in *Staff Report on Burrowing Owl* (CDFG 2012). Should any nesting raptors be identified, nest locations would be recorded, and an agency-approved buffer would be established for working in the area. If construction cannot be timed to avoid nesting raptors and they are identified during pre-construction surveys, a biological monitor would be present to monitor disturbance to any nesting birds. With the implementation of these measures, the impacts of Alternative A8 B to nesting raptors would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new action would be taken. Therefore, no impacts to nesting raptors would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Pond R4 would be breached along the Ravenswood Slough, and part of the levee near Greco Island would be lowered; Pond R4 would be turned into tidal marsh habitat; and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds. A water control structure would also be installed on Pond R3. The breaching of the levees would require construction equipment, and the noise from construction could potentially impact nesting raptors, which would be a significant impact.

To minimize the construction impact, work would be done outside of the nesting season to the extent possible. If work were to occur during the nesting season, pre-construction surveys would be conducted to identify any nesting raptors within 500 feet of the project construction areas (or an agency-approved distance); burrowing owl surveys would follow the CDFW protocol, as provided in *Staff Report on*

Burrowing Owl (CDFG 2012). The potential burrowing owl habitat in adjacent Bedwell Bayfront Park would not be physically affected by project construction, but there could be noise-related disturbances to these owls. Should any nesting raptors be identified, nest locations would be recorded, and an agency-approved buffer would be established for working in the area. If construction cannot be timed to avoid nesting raptors and they are identified during pre-construction surveys, a biological monitor would be present to monitor disturbance to any nesting birds. With the implementation of these measures, the impact of Alternative Ravenswood B to nesting raptors would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, Pond R4 would be breached along the Ravenswood Slough, and breached and lowered along San Francisco Bay near Greco Island. Near Greco Island, a boardwalk and viewing platform would be constructed, and a new trail would be created between Ponds R4 and R5. Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into tidal mudflats regulated by water control structures. Water control structures would also be installed on Pond R3.

The breaching of the levees would require construction equipment; noise from construction could potentially impact nesting raptors, which would be a significant impact. The potential burrowing owl habitat in adjacent Bedwell Bayfront Park would not be physically affected by the project construction, but there could be noise-related disturbances to these owls. Also, the new trails could impact raptors; however, these impacts would not be expected to be significant due to existing public access, lack of nesting habitat, and availability of other nesting habitat nearby.

To minimize impacts from construction, the avoidance and minimization measures described for Alternative Ravenswood B would be implemented. With the implementation of these measures, the impact of Alternative Ravenswood C to nesting raptors would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, Pond R4 would be breached along the Ravenswood Slough, Pond R4 would be turned into tidal marsh habitat, and the AAC levee would be fortified. Also, Ponds R5 and S5 would be turned into enhanced managed ponds; the installation of water control structures and a connection to the Bayfront Canal Project would allow the ponds to be operated to temporarily detain peak stormwater flows. Water control structures would also be installed on Pond R3. A new trail and boardwalk would be constructed near Greco Island. Also, Alternative D would create habitat transition zones in two locations in Pond R4.

Impacts associated with Alternative Ravenswood D would be similar to those under Alternative Ravenswood B except more habitat transition zones and water control structures would be created, increasing the duration of construction and the potential for disturbance. To minimize impacts from construction, the avoidance and minimization measures described for Alternative B would be implemented. With the implementation of these measures, the impacts of Alternative Ravenswood D to nesting raptors would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.5-4. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP, and other Refuge management documents and practices. The Biological Resources analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.5-4 Phase 2 Summary of Impacts – Biological Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
SBSP Impact 3.5-1: Potential reduction in numbers of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS /B	NI	LTS	LTS /B	LTS
SBSP Impact 3.5-2: Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS /B	LTS
SBSP Impact 3.5-3: Potential habitat conversion impacts to western snowy plovers.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS
SBSP Impact 3.5-4: Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS /B	LTS /B	LTS /B
SBSP Impact 3.5-5: Potential reduction in the numbers of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS
SBSP Impact 3.5-6: Potential reduction in foraging habitat for diving ducks, resulting in a substantial decline in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS	NI	LTS /B	LTS	LTS /B
SBSP Impact 3.5-7: Potential reduction in foraging habitat for ruddy ducks, resulting in a substantial decline in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS /B	LTS	LTS /B
SBSP Impact 3.5-8: Potential habitat conversion impacts on California least terns.	NI	NI	NI	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS/B	LTS/B
SBSP Impact 3.5-9: Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew and further isolation of these species' populations due to breaching activities and scour.	LTS /B	LTS /B	LTS /B	NI	LTS /B	LTS /B	NI	LTS /B	NI	LTS /B	LTS /B	LTS /B

Table 3.5-4 Phase 2 Summary of Impacts – Biological Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
SBSP Impact 3.5-10: Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
SBSP Impact 3.5-11: Potential construction-related loss of or disturbance to nesting pond-associated birds.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
SBSP Impact 3.5-12: Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
SBSP Impact 3.5-13: Potential effects of habitat conversion and pond management on steelhead.	LTS /B	LTS /B	LTS /B	NI	LTS /B	LTS	NI	LTS	NI	NI	NI	NI
SBSP Impact 3.5-14: Potential impacts to estuarine fish.	LTS /B	LTS /B	LTS /B	NI	LTS /B	LTS	NI	NI	NI	LTS /B	LTS	LTS /B
SBSP Impact 3.5-15: Potential impacts to piscivorous birds.	LTS /B	LTS /B	LTS /B	NI	LTS	LTS	NI	LTS	NI	LTS /B	LTS /B	LTS /B
SBSP Impact 3.5-16: Potential impacts to dabbling ducks.	LTS /B	LTS /B	LTS /B	NI	LTS	LTS	NI	LTS	NI	LTS /B	LTS /B	LTS /B
SBSP Impact 3.5-17: Potential impacts to harbor seals.	LTS /B	LTS /B	LTS /B	NI	LTS /B	LTS /B	NI	NI	NI	NI	NI	NI
SBSP Impact 3.5-18: Potential recreation-oriented impacts to sensitive species and their habitats.	LTS	LTS	LTS	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS
SBSP Impact 3.5-19: Potential impacts to special-status plants.	NI	LTS	LTS	NI	NI	NI	NI	NI	NI	NI	NI	NI
SBSP Impact 3.5-20: Colonization of mudflats and marsh plain by non-native *Spartina* and its hybrids.	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
SBSP Impact 3.5-21: Colonization by non-native *Lepidium*.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS

Table 3.5-4 Phase 2 Summary of Impacts – Biological Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
SBSP Impact 3.5-22: Increase in exposure of wildlife to avian botulism and other diseases.	NI	NI	NI	NI	NI	NI	NI	NI	NI	LTS	LTS	LTS
SBSP Impact 3.5-23: Potential impacts to bay shrimp populations.	LTS /B	LTS /B	LTS /B	NI	LTS /B	LTS /B	NI	LTS	NI	LTS /B	LTS /B	LTS /B
SBSP Impact 3.5-24: Potential impacts to jurisdictional wetlands or waters.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS /B	LTS /B	LTS /B
SBSP Impact 3.5-25: Potential construction-related loss of, or disturbance to, nesting raptors (including burrowing owls).	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS

Note: Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA).

B = Beneficial (NEPA only)

LTS = Less than Significant

NI = No Impact

The levels of significance for the impacts listed above assume that the Adaptive Management Plan and all program-level mitigation measures are integral components of the project and that management responses would be implemented based on ongoing monitoring and applied studies.

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3.6 Recreation Resources

This section of the Final Environmental Impact Statement/Environmental Impact Report (referred to throughout as the Final EIS/R) describes the existing recreational resources within the Phase 2 project area and analyzes whether the project implementation would cause a substantial adverse effect on recreational resources. The information presented is based on a review of existing recreational resources within the area and other pertinent federal, state and local regulations. The analysis of the project's impacts on recreational resources is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of this project. Therefore, this section only includes additional mitigation measures as needed.

Appendix F, Recreation Resources, contains a detailed discussion of recreation resources for the Phase 2 project area of the South Bay Salt Pond (SBSP) Restoration Project and provides information on the following topics:

- Regulatory Framework;
- Existing Recreation and Public Access Facilities;
- Recreation Regulatory Permit Requirements;
- Phase 2 Public Access and Recreation Alternatives;
- Projected Trail Use; and
- Recreation and Public Access Design Guidelines.

3.6.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). The baseline condition specific to the Phase 2 area pond clusters is based on the current condition of these areas.

Regional Setting

The Phase 2 project area includes the four pond clusters. Three of these pond clusters are located in the Alviso pond complex, and the fourth is located in the Ravenswood pond complex.

With the exception of Charleston Slough, which is owned by the City of Mountain View, all of these ponds are owned and managed by the United States Fish and Wildlife Service (USFWS) as part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge).

Project Setting

Existing recreation and public access facilities in and near the project area – as well as facilities proposed by projects or general, master, or recreation plans other than the SBSP Restoration Project – are shown on Figure 3.6-1 and described in Tables 3.6-1 through 3.6-4. These lists are not meant to be comprehensive or exhaustive of every public access opportunity or recreational resource, but they are intended to give a sense of the existing conditions regarding recreation and public access in the vicinity of each of the pond clusters.

3.6.2 Regulatory Setting

This section provides a summary of the regulatory framework for the area of the SBSP Restoration Project.

Regulatory and Managerial Framework

United States Fish and Wildlife Service

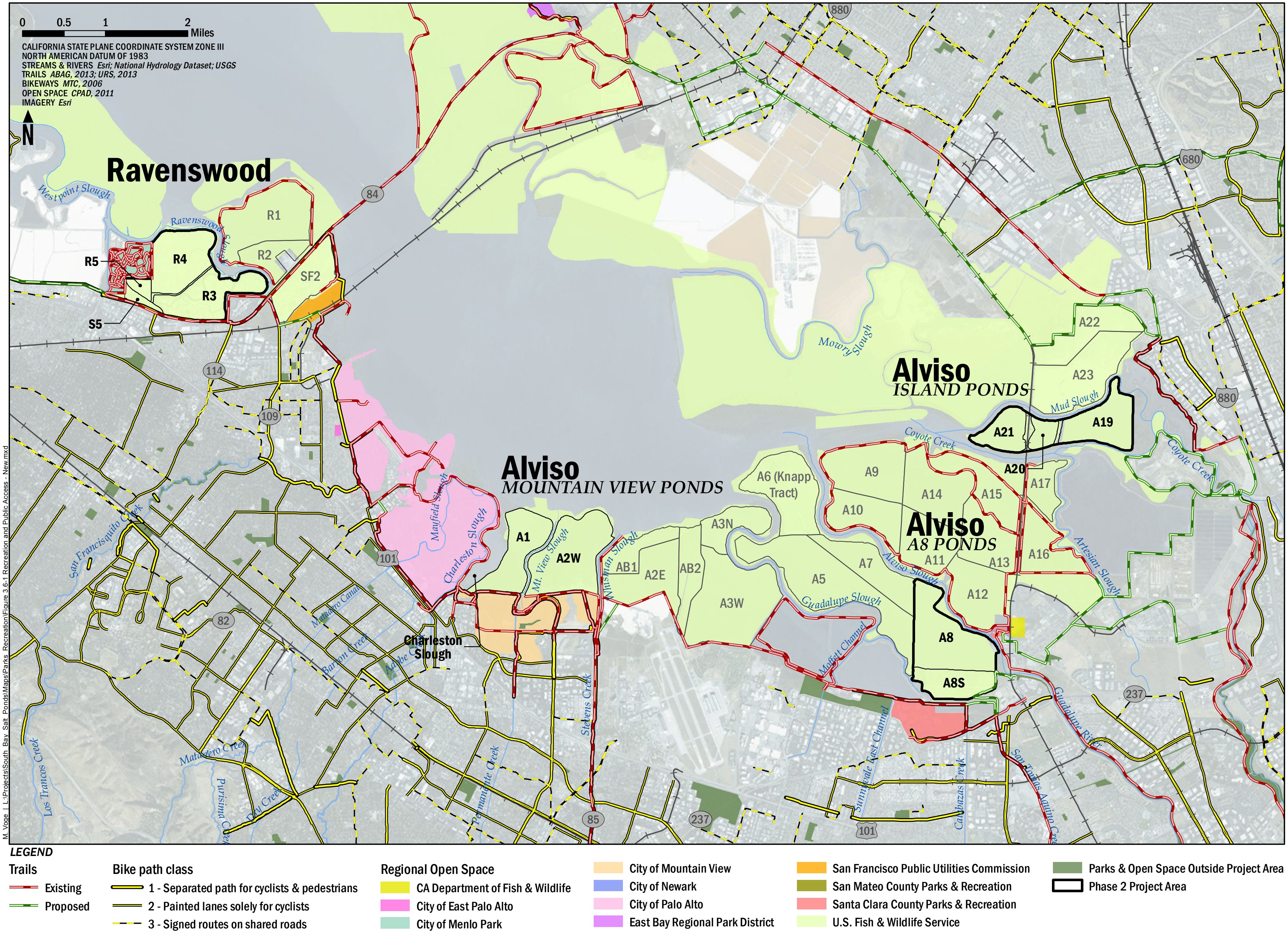
The Alviso and Ravenswood pond complexes are owned and managed by the USFWS as part of the Don Edwards San Francisco Bay National Wildlife Refuge. These pond complexes are governed by laws, executive orders, and directives that guide public use and recreation on National Wildlife Refuges. The National Wildlife Refuge System, which was established for the American public to develop an appreciation for fish and wildlife, identifies six wildlife-dependent recreational uses: hunting, fishing, wildlife observation, photography, environmental education, and interpretation.

Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) has jurisdiction relative to recreation and public access over the Phase 2 area of the SBSP Restoration Project. The McAteer-Petris Act (California Government Code 66600 – 66682) is the key legal provision under California state law that preserves San Francisco Bay from indiscriminate filling. BCDC administers the *San Francisco Bay Plan* for the long-term use of the Bay, reviews applications for projects that fall within BCDC jurisdiction for their ability to provide “maximum feasible public access.” BCDC requires locations for water-oriented land uses and increased public access to shoreline and waters, and encourages the provision of maximum feasible public access to the Bay and its shoreline as long as such access is compatible with wildlife protection. The *San Francisco Bay Plan* also contains policies that encourage the development of waterfront recreation facilities and linkages between existing shoreline parks, and requires the provision of these opportunities in relationship to sensitive biological species, habitats, and future restoration of salt ponds.

The jurisdiction of these two agencies composes the primary legal and managerial framework with which to plan and manage existing and proposed recreation and public access for the area of the SBSP Restoration Project.

The cities of Mountain View, Palo Alto, and Menlo Park own adjacent recreation facilities that connect directly to trails and recreation facilities that would be constructed as part of the project. In addition, there are several trail studies and master plans in and around the SBSP project area that contain policies and recommendations for recreation and public access facilities.



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South Bay Salt Pond Restoration Project

Figure 3.6-1
Recreation and Public Access

Table 3.6-1 Alviso–Island Ponds Existing Public Access and Recreation

RECREATIONAL FEATURES	NEARBY LOCATIONS
Trails	**Bay Trail Spine** The nearest segment of the Bay Trail is approximately 0.5 mile east of Pond A19, constructed as part of Bayside Business Park, or approximately 1 mile north at Auto Mall Parkway.
Boating	**Bay and its tributaries** Access is not restricted in waterways around the Phase 2 ponds, but boating within the ponds is restricted to hunting (see below).
Access Points and Staging Areas	**Bayside Business Park** There are two trailheads nearby, but no land access to the Alviso-Island pond cluster (Island Ponds).
Waterfowl Hunting	**Hunting by boat is allowed.** ▪ Pond A19 is open for hunting 7 days a week during the fall and winter waterfowl hunting season. ▪ Access to Pond A19 is by boat only. Boats must access Pond A19 from the Bay and hunting is only allowed from the boat inside the pond. ▪ Shooting from levees is prohibited. ▪ Ponds A20 and 21 are not open for hunting.
Dog Use	Dogs are allowed in hunting areas during waterfowl hunting season, with a Special Use Permit.
Fishing	Fishing by boat is allowed in the Bay and sloughs only. Fishing is prohibited in all Refuge ponds and from levees.
Environmental Education Center at the Refuge	Docent-led tours and interpretive displays at the Environmental Education Center (EEC) at the Refuge provide an overview of the Island Ponds from trails at Ponds A16 and A17, south of Coyote Creek. No physical access to the area is allowed.

Table 3.6-2 Alviso–A8 Ponds Existing Public Access and Recreation

RECREATIONAL FEATURES	NEARBY LOCATIONS
Trails	Access to levee roads is currently allowed for driving vehicles, walking, or bicycling associated with hunting. There is a 9-mile loop trail accessed from the Alviso Marina County Park around Alviso pond complex Ponds A9 –A14. **Bay Trail Spine** Planned Bay Trail segment is located at the southeast corner of Pond A8S. Existing Bay Trail spine is located south of Pond A8S on the south side of Guadalupe Slough, adjacent to Sunnyvale Baylands Park.
	Guadalupe River Trail This trail, which is east of the project site, is planned to connect to the Bay Trail at Alviso Marina County Park.
Boating	**Bay and Its Tributaries** Access is not restricted in waterways around the Phase 2 ponds, but boating is not permitted within the ponds except during hunting season and with a permit
	Alviso Marina County Park (Santa Clara County Parks) A boat launch, marina, and a Bay Area Water Trail access point are nearby.
Parks	**Alviso Marina County Park (Santa Clara County Parks)** Recreation activities include hiking, bicycling, bird watching, and picnicking. Dogs are allowed in the County Park's pathways and picnic areas, but are not allowed on the trails, levees, and boardwalks. A boat launch provides access to San Francisco Bay for motorized and non-motorized watercraft. The site is a designated access point for the Bay Area Water Trail.
	Baylands Park (City of Sunnyvale) Active recreation resources include hiking, bicycling, amphitheater, picnicking, group facilities, and four playground areas. Pets are not allowed within the park.
Access Points and Staging Areas	Gold Street gate provides access to ponds and levees for waterfowl hunting only.
Viewing Platforms	Wildlife observation areas, platforms, boardwalks, and benches are located at the EEC, Alviso Marina County Park, and Baylands Park.
Waterfowl Hunting	Pond A8 is open to waterfowl hunting on Wednesdays, Saturdays, and Sundays during the fall and winter waterfowl hunting season. Access to ponds by hunters with a permit is allowed from Gold Street in Alviso. Hunters must maintain a minimum distance of 300 feet from adjacent hunters when hunting on the levees. Hunting from boats is allowed. Motorized vehicles on levees are not allowed.
Dog Use	Dogs are allowed in hunting areas during waterfowl hunting season, with a Special Use Permit.
Fishing	Fishing is allowed by boat in the Bay and sloughs only. Fishing is prohibited in all Refuge ponds and from levees.
Environmental Education Center at the Refuge	Docent-led tours and interpretive displays are located at the EEC, approximately 0.5 mile east of Pond A8.

Table 3.6-3 Alviso–Mountain View Ponds Existing Public Access and Recreation

RECREATIONAL FEATURES	NEARBY LOCATIONS
Trails	**Bay Trail Spine** The Bay Trail spine is in Mountain View's Shoreline Park, south of Pond A1 and Pond A2W, west and south of Charleston Slough.
	Adobe Creek Loop Trail (Bay Trail) The Bay Trail is located west of Charleston Slough, in the Palo Alto Baylands Nature Preserve.
	Stevens Creek Trail The trail is located between Ponds A2W and A2E, on the east levee of Stevens Creek.
	Mountain View Shoreline Park The park has 8 miles of paved trails.
Access Points and Staging Areas	**Palo Alto Baylands Nature Preserve** (west of the pond cluster)
	San Antonio Road/Terminal Boulevard (parking, restrooms, and trailhead)
	Shoreline Park, Mountain View (south of the pond cluster)
Boating	**Bay and its tributaries** Access is not restricted in waterways around the Phase 2 ponds, but boating is not permitted within the ponds.
	Palo Alto Baylands Nature Preserve Non-motorized, hand-launched watercraft are allowed. There is a Bay Area Water Trail access point.
	Mountain View Shoreline Park A 50-acre sailing lake is located within Shoreline Park, with non-motorized watercraft rental and lessons, windsurfing, and other facilities
Waterfowl Hunting	Per USFWS Hunting Regulations, Ponds A2E and AB1, east of the project area, are open to waterfowl hunting on Wednesdays, Saturdays, and Sundays during the fall and winter waterfowl hunting season; a Refuge Special Use Permit is required. Ponds A1 and A2W are not open for hunting.
Dog Use	**USFWS Refuge Lands** Dogs are allowed in hunting areas during waterfowl hunting season, with a Special Use Permit
	Palo Alto Baylands Nature Preserve Dogs are allowed on leash.
	Mountain View Shoreline Park Dogs not allowed within the park. There is an adjacent dog park outside Shoreline Park's limits.
Fishing	Fishing is allowed by boat in the Bay and sloughs only. Fishing is prohibited in all Refuge ponds and from levees.
Palo Alto Baylands Park and Nature Preserve	The park offers docent-led tours, interpretive displays, environmental education field trips, hands-on activities, classroom presentations, and other outreach.
Mountain View Shoreline Park	The park offers docent-led tours focusing on the environment, interpretive displays, a Junior Ranger program, sailing, and watercraft activities. The park has an 18-hole golf course, a clubhouse, and banquet facilities. The historic Rengstorff House is located in the park, and there are areas for jogging, walking, bird watching, and kite flying.
Viewing Platforms	Wildlife observation areas, platforms, and benches are located along the site perimeter at the south end of Charleston Slough, in Palo Alto Baylands Park and Nature Preserve and Shoreline Park

Table 3.6-4 Ravenswood Ponds Existing Public Access and Recreation

RECREATIONAL FEATURES	NEARBY LOCATIONS
Trails	**Bay Trail Spine** The Bay Trail spine extends along State Route (SR) 84/Bayfront Expressway and the south borders of Ponds R3 and S5 and continues between Ponds R2 and SF2 and onto the Dumbarton Bridge.
	Ravenswood Trail Hiking is allowed on this unimproved trail around Ponds R1 and R2, east of the Phase 2 site.
	Phase 1 Bay Trail Spur This trail lies east of the Phase 2 site, along the eastern edge of Pond SF2.
	Bedwell Bayfront Park Trail A loop trail winds around the perimeter of the park, adjacent to Ponds R4, R5, and S5. Other trails are located within the park.
	Facebook Loop Trail This trail is a paved public shoreline trail southeast of Pond R3.
Boating	No boating is allowed.
Access Points and Staging Areas	An access road and parking areas are located at the Marsh Road entrance to Bedwell Bayfront Park and further into the park on the western side, near the restrooms
Waterfowl Hunting	At Greco Island (adjacent to Pond R4), waterfowl hunting by boat only is allowed 7 days a week. No land or tidal access is allowed. At Ponds R1 and R2, waterfowl hunting is allowed seven days a week, only from the existing levees. Access to ponds is by foot or bicycle from either of two trailheads off SR 84. Hunting is prohibited within 300 feet of SR 84 and the Pacific Gas and Electric Company (PG&E) substation.
Dog Use	**Bedwell Bayfront Park** Dogs are allowed on leash.
	USFWS Refuge Lands Dogs are allowed in hunting areas during waterfowl hunting season, with a Special Use Permit.
Fishing	Fishing is allowed by boat in the Bay and sloughs only. Fishing is prohibited in all Refuge ponds and from levees.
Interpretive Exhibits and Viewing Platforms	Exhibits are located in the parking area at the entrance to Bedwell Bayfront Park on Marsh Road, at a viewing point at the top of the hill near the northeast corner of the park, and along the Pond SF2 Trail.

Association of Bay Area Governments Bay Trail

The Bay Trail (www.baytrail.org) is a planned, continuous 500-mile bicycling and hiking path around San Francisco Bay. When complete, the trail will pass through 47 cities and all 9 Bay Area counties, and will cross 7 toll bridges. To date, more than two-thirds of the length of the Bay Trail alignment has been developed. In reaching this significant milestone, there is increased interest in closing the remaining gaps in the trail system. Although not a regulatory agency, Association of Bay Area Governments (ABAG) Bay Trail has an interest in the project as a partner and potential funding source, but each segment of the Bay Trail has a local "owner" agency that develops and operates the trail segments within its own jurisdiction. The Bay Trail Plan has been prepared in consultation with local governments, and is periodically amended and updated in consultation with them. BCDC considers the Bay Trail Plan in making determinations as to whether a project is consistent with their policies on public access.

Segments of the Bay Trail are located adjacent to the project area, and facilities associated with the Bay Area Water Trail and overseen by the State Coastal Conservancy are located nearby. Many of the public access facilities constructed as part of Phase 2 of the project could connect to these existing trail segments. New trail segments being considered as part of Phase 2 actions are not currently shown as planned segments of the Bay Trail but could be considered as part of the Bay Trail network in the future.

Recreation-related plans and policies of federal, state, and local agencies are described in Appendix F.

Recreation-Related Review and Permits

Proposed recreation components may be subject to various federal and state regulations that would require approvals, permits, and/or consistency determinations for the proposed recreation and public access development.

BCDC will review and – under regulatory authority – approve permits for public access and recreation facilities within the project area. BCDC permit overview requirements are described in Appendix F.

Depending on the location of the proposed public access and recreation facilities, the USFWS may be exempt from the permit requirements of other regional and local jurisdictions. However, because the lead agencies may partner with regional or local groups (e.g., regional park districts, counties, and cities) to execute specific recreation-related project components, plan reviews, agreements, and/or permits may be needed or required. Agencies that may have review and/or permit requirements over proposed recreational components include the planning, recreation, park district, public works, and/or flood control departments of the municipalities where the project components occur.

Table 3.6-5 provides a summary of the types of permits or agreements that may be required to carry out specific construction or maintenance activities associated with the recreation and public access development.

Table 3.6-5 Recreation-Related Regulations and Permit Summary

ADMINISTERING AGENCIES	DESIGN REVIEW/AGREEMENT/PERMIT	REGULATION
USFWS	Provides Compatibility Determination (Priority Uses).	National Wildlife Refuge System Improvement Act
	Provides Programmatic Consultation to create the Biological Opinion.	Federal Endangered Species Act Section 7 and 9
	Requires Habitat Conservation Plan (including “take permit,” no-surprises clause, safe harbors, and yet-to-be listed species protection for landowner).	Federal Endangered Species Act Section 10
	Issues “no effect” or “not likely to affect” letter.	Consultation with the United States Army Corps of Engineers (USACE) under Section 7
	Protects against destruction of migratory bird nests and possession of migratory bird “parts.”	Migratory Bird Treaty Act

Table 3.6-5 Recreation-Related Regulations and Permit Summary

ADMINISTERING AGENCIES	DESIGN REVIEW/AGREEMENT/PERMIT	REGULATION
CDFW	California Environmental Quality Act (CEQA) review (wetland/riparian mitigation and monitoring plans).	California Environmental Quality Act
	Issues streambed alteration permit required for any modification of a streambed or bank.	California Fish and Game Code Section 1600
	Provides State Management Agreement (Take Permit) for state-listed species.	California Endangered Species Act
	Protects native resident and migratory bird eggs and nests.	California Fish and Game Code Sections 3503 and 3503.5
BCDC	Conducts reviews for filling, dredging, substantial change in use, or development activities at the salt ponds or managed wetland areas, including recreation-related projects.	McAteer-Petris Act, Coastal Zone Management Act
San Francisco Bay Regional Water Quality Control Board	Issues water quality certification as part of USACE permit.	Section 401 of the Federal Clean Water Act
United States Army Corps of Engineers	Issues Nationwide or Individual Permit to perform dredge or fill activities in the Waters of the U.S., including wetlands.	Section 404 of Federal Clean Water Act, Porter-Cologne Water Quality Act
	Issues permit to create obstructions or fill of navigable waters of the U.S.	Section 10 of the Rivers and Harbors Act of 1899

3.6.3 Proposed Recreation and Public Access Facilities

The Phase 2 action alternatives propose restoration, flood management, and recreation/public access activities at two of the separate pond clusters included in Phase 2: the Alviso-Mountain View pond cluster (also referred to as the Mountain View Ponds) and the Ravenswood pond cluster (also referred to as the Ravenswood Ponds). Actions at these pond clusters are independent of any activity at the other clusters and essentially constitute stand-alone projects. There are no recreation/public access features planned or proposed under Phase 2 at the Island Ponds or A8 Ponds. Each action alternative differs in the provision of recreation and public access features, while the No Action Alternative maintains the existing facilities with no new facilities. The Island Ponds and A8 Ponds do not currently provide recreation or public access facilities other than waterfowl hunting under a Refuge-issued permit).

For the Mountain View Ponds and Ravenswood Ponds, recreation and public access features are proposed to supplement the existing trail network and recreational/public access experience in adjacent park areas. The proposed features include spur trails and viewing platforms that connect with the existing trail system. These trail connections would provide closer access to the Bay, its shoreline, and adjacent restored areas that would not be possible without the project. These positive impacts of the project would provide considerable benefits to a large, urbanized group of recreational and research-based visitors. While no recreation or public access facilities are proposed for the Island Ponds or the A8 Ponds under Phase 2, this does not preclude future public access or recreation facilities from being included in future project phases.

Alviso-Island Pond Cluster

The Alviso-Island pond cluster (also referred to as the Island Ponds) consists of Ponds A19, A20, and A21; the levees surrounding each pond; and some of the fringe marsh outside of these levees, including the narrow marsh between Ponds A19 and A20. Pond A19 is available for hunting by boat only, by special permit.

Under Alternatives Island A, Island B, and Island C, there would be no new public access or recreation improvements to these ponds. Hunting would continue under current regulations. Both hunting and fishing recreational opportunities have benefitted from habitat restoration at the Island Ponds in Phase 1 due to the increase in waterfowl and fish utilizing these areas. There is no projected change in recreational use as a result of any of these alternatives.

Alviso-Mountain View Pond Cluster

The Alviso-Mountain View pond cluster (also referred to as the Mountain View Ponds) consists of Pond A1, Pond A2W, the levees surrounding each pond, some of the fringe marsh outside of the pond and slough levees, Permanente Creek, and Mountain View Slough. For the purposes of Phase 2 planning and in this EIS/R, Charleston Slough, which is owned by the City of Mountain View, is considered part of the Mountain View Ponds, as are the northern, western, and southern levees and the water control structure surrounding it. The western levee border of Charleston Slough is owned by the City of Palo Alto; the other levees are City of Mountain View property.

Existing recreation and public access facilities in the general area include the Palo Alto segment of the Bay Trail, the Mountain View segment of the Bay Trail, restrooms and trailhead access facilities at San Antonio/Terminal Road, a viewing platform at the south end of Charleston Slough, and other local trails and recreational facilities in Shoreline Park. These facilities would remain unchanged but would be temporarily closed or relocated during construction, or rebuilt, depending on the project alternative. None of these facilities would be permanently removed.

Alternative Mountain View A (No Action)

Under Alternative Mountain View A, no new public access or recreation features would be completed. Existing trails on many of the levees along the boundary of the Alviso-Mountain View pond cluster would continue to be maintained. There would be no projected increase in recreation use as a result of this alternative.

Alternative Mountain View B

A new trail, viewing platform, and interpretative platform would be installed to improve recreation and public access facilities at the Mountain View Ponds. A 700-foot-long spur trail would be constructed along the improved western levee of Pond A1 (adjacent to Charleston Slough) to a viewing platform. Wildlife viewing opportunities from the trails along the southern shore of Pond A1 would be improved. The trail design would account for landfill cells below and behind the trail, and the trail would be designed to avoid these landfill cells. A new viewing platform would be constructed along the existing Bay Trail near the southeast corner of Pond A1 at Permanente Creek.

Levee crests destined for trail access would be finished with a 4-inch-thick layer of crushed gravel to provide all-weather access and to be compliant with the Architectural Barriers Act (ABA) on federal lands and the Americans with Disabilities Act (ADA) where the trails are part of the Bay Trail system or where project partners (e.g., state, county, or city agency) have compliance obligations.

Areas adjacent to this pond cluster are already in use, primarily by hikers and bicyclists. The project would provide new recreational facilities and would increase recreational enjoyment of the pond cluster.

The projected increase in recreation use as a result of project actions is 50 to 60 additional users per day during peak periods of use.

Alternative Mountain View C

Under Alternative Mountain View C, approximately 9,600 feet of new trails, four viewing platforms and a 700-foot boardwalk would be installed to improve recreation and public access at the Alviso-Mountain View pond cluster. A viewing platform would be constructed along the existing trail on the southern border of Pond A1 near the eastern end of the pond. The landward side of the Pond A1 breach would be armored to prevent the levee beneath the trail and viewing platform from being scoured away. As part of restoration and flood control actions, the existing trail along the improved, raised western and southern levees of Charleston Slough would be rebuilt, a viewing platform would be added along the southern trail on Pond A1, a spur trail and viewing platform would be constructed at the northern end of Charleston Slough. A trail along the levee on the east and north sides of Pond A2W, extending to the end of the PG&E access road (including a bridge over breaches on this levee), and a trail and viewing platform on the improved levee would also be constructed. These features would improve wildlife and habitat viewing opportunities.

Levee crests destined for trail access would be finished with a 4-inch-thick layer of crushed gravel to provide all-weather access and to be compliant with the Architectural Barriers Act (ABA) on federal lands and the Americans with Disabilities Act (ADA) where the trails are part of the Bay Trail system or where project partners (e.g., state, county, or city agency) have compliance obligations.

The projected increase in recreation use as a result of this alternative is 100 to 150 additional users per day during peak use periods. New trail spurs and viewing platforms are dispersed throughout the project area.

Alviso-A8 Pond Cluster

The Alviso-A8 pond cluster (also referred to as the A8 Ponds) consists of Ponds A8 and A8S and the levees surrounding each pond. This pond cluster is located in the southern portion of the 25-pond Alviso pond complex. Except for waterfowl hunting by Refuge permit, no other public access or recreation is currently provided at these ponds. The Bay Trail spine passes nearby, across San Tomas Aquino Creek to the south.

Alternative A8 A (No Action)

Under Alternative A8 A, no new public access or recreation features would be completed. The Bay Trail spine to the south of these ponds would be unaffected. There is no projected increase in recreation use as a result of project actions.

Alternative A8 B

Under Alternative A8 B, habitat transition zones would be constructed in the southern corners of Pond A8S to add habitat complexity and to buffer the neighboring landfill against future damage from a sea level rise or intrusion. No public access or recreation additions or improvements are proposed. There is no projected increase in recreation use as a result of project actions.

Ravenswood Ponds

The Phase 2 Ravenswood pond cluster consists of Ponds R3, R4, R5, and S5; the levees surrounding each pond; some of the fringe marsh outside of these levees; and the All-American Canal (AAC). Existing trails, trailheads, access points and viewing platforms in Bedwell Bayfront Park, along SR 84, and surrounding areas are not within the project area and would remain unchanged; however, some existing trail facilities may be subject to temporary closure or relocation during project construction.

Alternative Ravenswood A (No Action)

Under Alternative Ravenswood A, no new public access or recreation features would be completed. Existing trails at adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, and the existing Bay Trail along SR 84 would continue to be used and separately maintained.

Alternative Ravenswood B

Under Alternative Ravenswood B, a viewing platform would be constructed on or adjacent to an existing trail near Ponds R5 and S5 to improve the public access available at the adjacent wildlife habitat in the area of Ponds R5 and S5. By incorporating viewing platforms at these ponds, this action would enhance the public's recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park. No new trails would be constructed under this alternative.

The project would provide some new recreational facilities, with 50 to 60 additional users per day projected during peak use.

Alternative Ravenswood C

A 2,700-foot-long improved trail along the eastern levees of Ponds R5 and S5 would be constructed and linked to the existing trails outside of these ponds. This trail would require improvements to the berm-like levees between R4 and R5, between R3 and R5, and between R3 and S5 to raise the trail elevation and provide sufficient width (minimum 8 feet) for a two way trail. Many of these levee improvements would be made regardless of the trail because of the need to prevent uncontrolled tidal flows into Ponds R5 and S5. This alternative would include 1,500 feet of trail on improved levee to meet needs associated with excluding tidal flows, as well as 1,200 feet of trail on existing levees improved to provide adequate width and level trail surface to meet state and federal accessibility guidelines. The proposed water control structures between R4 and R5 and between R3 and S5 would need to be set low enough to allow the trail to be constructed on top of them. Also, this trail would necessitate a break in the fence along the southern border of Ponds R5 and S5 where it leaves the Refuge and connects to the Bay Trail.

A viewing platform near Ponds R5 and S5 would be constructed on or adjacent to an existing trail to improve the public access available at the adjacent wildlife habitat in Ponds R5 and S5. By incorporating viewing platforms at these ponds, this action would enhance the public's recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park.

A 1,200 foot spur trail and viewing platform would be constructed along the northwestern corner of Pond R4. The trail would begin at the northeast corner of the Bedwell Bayfront Park and extend to the northeast along a boardwalk above the lowered and breached levee. A new viewing platform would be constructed at the northern terminus of the trail.

Levee crests destined for trail access would be finished with a 4-inch-thick layer of crushed gravel to provide all-weather access and to be compliant with the Architectural Barriers Act (ABA) on federal lands and the Americans with Disabilities Act (ADA) where the trails are part of the Bay Trail system or where project partners (e.g., state, county, or city agency) have compliance obligations.

The project would provide new recreational facilities, with 100 to 150 additional users per day projected during peak use. A new trail connection from the Bay Trail along SR 84 would provide an additional access opportunity.

Alternative Ravenswood D

A 2,700-foot trail would be constructed along the eastern levees of Ponds R5 and S5 and linked to the existing trails located on the outer levees of these ponds to form a loop around these ponds. Levee improvements would be completed to allow a minimum 8-foot-wide accessible trail, and the levees would be elevated as needed to address projected sea level rise. The proposed water control structures between Ponds R4 and R5 and between Ponds R3 and S5 would need to be set low enough to allow the trail to be constructed on top of them. This trail would also necessitate a break in the fence along the southern border of R5 and S5 where it leaves the Refuge and connects to the Bay Trail.

A viewing platform would be constructed on or adjacent to an existing trail near Ponds R5 and S5 to improve the public access available at the adjacent wildlife habitat in the ponds. By incorporating viewing platforms at these ponds, this action would enhance the public's recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park.

A 1,200-foot spur trail and viewing platform would be constructed on the existing levee along the northwestern corner of Pond R4. The trail would begin at the corner of Bedwell Bayfront Park and extend to the northeast along the existing levee, which would be improved as needed for restoration and sea level rise projections.

Levee crests destined for trail access would be finished with a 4-inch-thick layer of crushed gravel to provide all-weather access and to be compliant with the Architectural Barriers Act (ABA) on federal lands and the Americans with Disabilities Act (ADA) where the trails are part of the Bay Trail system or where project partners (e.g., state, county, or city agency) have compliance obligations.

The project would provide new recreational facilities, with 100 to 150 additional users per day projected during peak use. A new trail connection from the Bay Trail along SR 84 would provide an additional access opportunity.

3.6.4 Environmental Impacts and Mitigation Measures

Significance Criteria

For the purposes of this EIS/R, the project would cause a significant impact to recreational resources if it:

- Would not provide maximum feasible public access, consistent with the proposed project (per BCDC);
- Would not be consistent with regional and local laws and recreation plans including USFWS mission and regulatory requirements;
- Would not be consistent with existing recreational uses;
- Would substantially reduce recreational opportunities at existing facilities;
- Would substantially displace public recreation activities or opportunities and comparable. recreation opportunities would not be available;
- Would cause an increase in the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated; or
- Would include recreational facilities which might have an adverse physical effect on the environment.

Under the No Action Alternative, no new recreation and public access facilities would be constructed and, in some instances, existing facilities such as trails that are on existing levees might not be maintained and would ultimately deteriorate and be eliminated. For each significance criterion listed above that would be triggered by the SBSP Restoration Project, a discussion is presented below. Beneficial impacts (as defined by the National Environmental Policy Act (NEPA) of the project are also identified.

Impact evaluations for the Action Alternatives are evaluated based on the existing conditions described in Section 3.6.3 above, and not the proposed conditions that would occur under the No Action Alternative. This approach is consistent with CEQA and NEPA protocols for analyzing project impacts. In this case, the No Action Alternative represents the continuation of the current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other Refuge operations practices into the future, with no change in that management.

As explained in Section 3.1.2, Environmental Setting and Impact Analysis, while both CEQA Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

A discussion of potential impacts for each pond cluster is presented below.

Program-Level Evaluation

The 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R) evaluated two potential recreation impacts of three long-term program-level alternatives. Programmatic Alternative A would be the No Action Alternative. Programmatic Alternative B would be a 50/50 mix of tidal marsh and enhanced managed ponds called the Managed Pond Emphasis. Programmatic Alternative C would be a mix of 90 percent tidal marsh/10 percent managed pond called the Tidal Marsh Emphasis. The determination was made in the 2007 EIS/R that under the implementation of Programmatic Alternative C, there would be a less-than-significant impact to most recreation resources. Under CEQA, the alternative would result in less-than-significant impacts on the provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.

Under NEPA, the alternative would result in beneficial impacts. For Programmatic Alternative C, the impact was determined to be potentially significant on permanent removal of existing recreational features (trails) because of a reduction in the amount of miles of land trails relative to Alternatives A and B; however, the addition of non-motorized boat access to Ravenswood Slough, with a connection to the San Francisco Bay Area Water Trail via this access, would provide a key link in the overall South Bay water trail access points. Also, the addition of new viewing platforms would increase the wildlife viewing opportunities over what currently exists at the Ravenswood pond complex.

Public Access and Impacts to Wildlife

A central theme to developing and implementing the overall SBSP project has been the concept of "Adaptive Management." Under an Adaptive Management approach, the outcomes of previous restoration efforts and ongoing management actions that have been implemented are analyzed, and the resulting information is utilized to modify management and develop new strategies to lessen impacts and achieve better restoration results. This approach is particularly effective with regards to potential impacts of trail use on wildlife, especially threatened and endangered species. The public access and wildlife compatibility studies conducted for the project have identified potential impacts from trail use in certain areas and on certain species, such as the endangered western snowy plover.

Alternatives B and C for Ravenswood Pond R3 and Alternative C for Alviso (in the Island Ponds) contained the following notation:

"Denotes trails that were identified during the alternatives development process as being of particular concern to permitting agencies for potential to disrupt habitat."

This means that the concerns of these agencies with respect to certain trails or recreational features may prevent the implementation of public access and recreation features that were represented conceptually in the 2007 EIS/R. Specific features in this category that are relevant to Phase 2 planning include the following:

- Pond R3 Loop Trail. Since Pond R3 currently provides habitat for nesting western snowy plovers, and is planned to continue to be a managed pond as part of Phase 2 actions, the Pond R3 loop trail has been eliminated in this phase. If a future action includes breaching Pond R3 to restore tidal action, then subsequent environmental analysis will be completed to evaluate the suitability of a spur trail and water trail access on the east side of Pond R3.

- Alviso-Island Pond Cluster – Ponds A20-21 Trail. The Alviso-Island pond cluster also provides endangered species habitat, and this trail was eliminated from implementation in this phase. In addition, completion of public access to these ponds would not provide a land connection to any other area. If future project actions include improvement of levees in adjacent areas, such as Ponds A17, A22 or A23, that could be considered to provide public access opportunities, then subsequent environmental analysis will be completed to evaluate the suitability of such trails.

Section 3.6, Biological Resources, of this EIS/R also discusses the issue of potential disturbance of wildlife associated with increased public access.

Other recreation impacts evaluated as part of program-level project planning and included in the 2007 EIS/R are outside the Phase 2 project area.

Project-Level Evaluation

Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, no new recreation activities would occur, and no new facilities would be provided in Phase 2. The Island Ponds would continue to be monitored and managed through the activities described in the AMP and accordance with current USFWS practices. Existing recreation use (hunting) would continue similar to existing conditions, and would not change in the long term. Although no new public access is proposed, there is no current land-based trail adjacent to this area, and the project area does not contain the designated Bay Trail spine; therefore there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, no new recreation activities would occur, and no new facilities would be provided in Phase 2. Existing recreation use (hunting) would continue similar to existing conditions, and would not change in the long term. Although no new public access is proposed, there is no current land-based trail adjacent to this area, and the project area does not contain the designated Bay Trail spine. A restored tidal marsh would enhance many of the wildlife-viewing opportunities for the non-motorized boaters that do visit the waterways around the Island Ponds.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Under Alternative Island C, no new recreation activities would occur, and no new facilities would be provided in Phase 2. Existing recreation use (hunting) would continue similar to existing conditions, and would not change in the long term. Although no new public access is proposed, there is no current land-based trail adjacent to this area, and the project area does not contain the designated Bay Trail spine. A restored tidal marsh would enhance many of the wildlife-viewing opportunities for the non-motorized boaters that do visit the waterways around the Island Ponds.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, no new public access or recreation features would be completed. Existing vehicular access to the PG&E facilities on the east side of Pond A2W would continue, but would not be opened to the public. The existing Bay Trail spine on adjacent City of Mountain View and City of Palo Alto lands provides a complete segment in this area, and would continue to be managed by these cities.

This alternative would not be consistent with BCDC policy to provide maximum feasible public access because no new public access or recreation facilities would be provided nor are any feasible. It should be noted, however, that public access as part of a future phase is not precluded.

Alternative Mountain View A: Potentially Significant

Alternative Mountain View B. Under Alternative Mountain View B, new public access and recreational facilities would be provided and would increase recreational opportunities at the Alviso-Mountain View pond cluster.

Existing vehicular access to the PG&E facilities on the east side of Pond A2W would continue to be maintained, but would not be publicly accessible. The existing Bay Trail spine on adjacent City of Mountain View and City of Palo Alto lands provides a complete segment in this area, and would continue to be managed by these cities.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing platforms, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities. Similarly, restored tidal marsh habitat would enhance many of the wildlife-viewing opportunities at the Mountain View Ponds.

Alternative Mountain View B would not be fully consistent with the BCDC policy to provide the maximum feasible public access; however, its public access and recreation components would move closer to that maximum level of access. This alternative would provide additional facilities that currently do not exist, but these facilities would not provide new public access to San Francisco Bay on the east Pond A2W levee, as described in the 2007 EIS/R. However, implementation of these proposed facilities would not preclude completion of additional public access facilities in a future phase.

Alternative Mountain View B Level of Significance: Potentially Significant

Alternative Mountain View C. Under Alternative Mountain View C, new public access and recreational facilities would be provided and would increase recreational enjoyment of the Alviso-Mountain View pond cluster.

Existing vehicular access to the PG&E facilities on the east side of Pond A2W would continue to be maintained, and this levee would be improved with a publicly accessible trail. The existing Bay Trail spine on adjacent City of Mountain View and City of Palo Alto lands provides a complete segment in this area, and would continue to be managed by these cities.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing platforms, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities. Similarly, restored tidal marsh habitat would enhance many of the wildlife-viewing opportunities at the Mountain View Ponds.

Alternative Mountain View C would be fully consistent with the BCDC policy to provide maximum feasible public access. This alternative would provide additional facilities that currently do not exist, and would provide new public access to San Francisco Bay on the east A2W levee, as described in the 2007 EIS/R.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, no new public access or recreation facilities would be provided in Phase 2, and the pond cluster would continue to be monitored in accordance with current USFWS practices. Existing recreation use (hunting) would continue similar to existing conditions, and would not change in the long term. No new public access is proposed, and the project area does not contain the designated Bay Trail Spine.

Physical access is currently available to the levees along the south portion of Pond 8A to hunters only, by special permit. Lands south of this area are designated for a future Bay Trail loop as well as provision of a viewing platform or interpretive feature to be coordinated with the City of San Jose for implementation.

This alternative would not be consistent with BCDC policy to provide maximum feasible public access because no new public access or recreation facilities would be provided. However, provision of a viewing platform or interpretive feature and public access as part of a future phase is not precluded, which would be contingent on the levees being opened to broader public access. Although no new public access is proposed, there is no current land-based trail adjacent to this area, and the project area does not contain the designated Bay Trail spine. Thus there is no impact associated with failing to add maximum feasible public access.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, no new public access or recreation facilities would be provided in Phase 2, and the Alviso-A8 pond cluster would continue to be monitored in accordance with current USFWS practices. Existing recreation use (hunting) would continue similar to existing conditions, and would not change in the long term. No new public access is proposed, and the project area does not contain the designated Bay Trail spine. although the Bay Trail spine is already complete just to the south of the area.

Physical access is currently available to the levees along the south portion of Pond 8A to hunters only, by special permit. Lands south of this area are designated for a future Bay Trail loop, as well as provision of a viewing platform or interpretive feature to be coordinated with the City of San Jose for implementation.

This alternative would not be consistent with BCDC policy to provide maximum feasible public access because no new public access or recreation facilities would be provided. However, provision of a viewing platform or interpretive feature and public access as part of a future phase is not precluded. This, however, would be contingent on the levees being opened to broader public access. Although no new public access is proposed, there is no current land-based trail adjacent to this area, and the project area does not contain the designated Bay Trail spine. Thus there is no impact associated with failing to add maximum feasible public access.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no new public access or recreation features would be completed. Existing trails at adjacent Bedwell Bayfront Park, owned by the

City of Menlo Park, and the existing Bay Trail along SR 84 would continue to be used and maintained separately.

This alternative would not be consistent with BCDC policy to provide maximum feasible public access because no new public access or recreation facilities would be provided, but public access as part of a future phase is not precluded.

Alternative Ravenswood A Level of Significance: Potentially Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, there would be new recreational facilities, but no new public access trails that would increase recreational access to the Ravenswood pond cluster are proposed. In addition, restored tidal marsh and other habitats would enhance many of the wildlife-viewing opportunities at the Ravenswood Ponds.

Improved viewing facilities will be a beneficial impact to recreation resources, and their provision is consistent with USFWS and BCDC policies to provide wildlife viewing opportunities.

Alternative Ravenswood B would not be consistent with BCDC policy to provide maximum feasible public access; however, its public access and recreation components would move closer to that maximum level of access. This alternative would provide additional facilities that currently do not exist, but would not provide new public access trails, as described in the 2007 EIS/R. However, implementation of these proposed facilities would not preclude completion of additional public access facilities in a future phase.

Alternative Ravenswood B Level of Significance: Potentially Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, there would be new public access and recreational facilities that would increase recreational enjoyment of the Ravenswood pond cluster. In addition, restored tidal marsh and other habitats would enhance many of the wildlife-viewing opportunities at the Ravenswood Ponds.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

A new trail connection from the Bay Trail along SR 84 to Bedwell Bayfront Park would provide an additional access opportunity, and is consistent with the provision of additional trails as described in the 2007 EIS/R.

Alternative Ravenswood C would be consistent with BCDC policy to provide maximum feasible public access. This alternative would provide additional facilities that currently do not exist, and would provide new public access to San Francisco Bay near Greco Island, as described in the 2007 EIS/R.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, there would be new public access and recreational facilities that would increase recreational enjoyment of the Ravenswood pond cluster. In addition, restored tidal marsh and other habitats would enhance many of the wildlife-viewing opportunities at the Ravenswood Ponds.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

A new trail connection from the Bay Trail along SR 84 to Bedwell Bayfront Park would provide an additional access opportunity, and is consistent with the provision of additional trails as described in the 2007 EIS/R.

Alternative Ravenswood D would be consistent with BCDC policy to provide maximum feasible public access. This alternative would provide additional facilities that currently do not exist, and would provide new public access to San Francisco Bay near Greco Island, as described in the 2007 EIS/R.

Alternative Mountain View D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.6-2: Permanent removal of existing recreational features (e.g., trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature.

The discussion of Impact 3.6-2 in the Draft EIS/R focused on trails, parking areas, and other land-based recreational access features. That discussion has been expanded in this Final EIS/R to include water-based recreation. Note that the existing conditions regarding water-based recreational features are that, of all of the Phase 2 ponds at the Don Edwards National Wildlife Refuge, only Pond A19 at the Island Ponds allows water-based recreation within the pond itself, and only then for seasonal waterfowl hunting with a Refuge-issued permit. None of the other Phase 2 ponds themselves are currently open to boating or other water-based recreation, so there would be no change as a result of this action. There is similarly no change being proposed for the streams around the ponds. However, flow rates outside of boat-accessible waterways near breach locations (in portions of Ravenswood Slough or Mud Slough, for example) would be higher after breaching than they are now because of tidal flow in and out of the ponds.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, there are currently no existing recreational features in the Alviso-Island pond cluster that are in use or would be removed.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, there are currently no existing recreational features in the Island Ponds that are in use or would be removed.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Under Alternative Island C, there are currently no existing recreational features in the Island Ponds that are in use or would be removed.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, there are currently no existing recreational features in the Alviso-Mountain View pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster are outside the project area and would continue to be maintained.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, there are currently no existing recreational features in the Alviso-Mountain View pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster are outside the project area and would continue to be maintained. Water-based recreation within the ponds is currently prohibited. Use of waterways outside of the ponds would not be permanently removed by this alternative, though flow rates may be higher near breaches.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. Under Alternative Mountain View C, there are currently no existing recreational features in the Alviso-Mountain View pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster are outside the project area and would continue to be maintained. Use of waterways outside of the ponds would not be permanently removed by this alternative, though flow rates may be higher near breaches.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, there are currently no existing recreational features in the Alviso-A8 pond cluster that would be permanently removed. Access to existing levees in the project area is allowed to hunters only, by special permit. This access would not permanently change under this alternative.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, there are currently no existing recreational features in the Alviso-A8 pond cluster that would be permanently removed. Access to existing levees in the project area is allowed to hunters only, by special permit. This access would not permanently change under this alternative.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, there are currently no existing recreational features in the Ravenswood pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster (Bedwell Bayfront Park and SR 84 Bay Trail spine) are outside the project area and would continue to be maintained.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, there are currently no existing recreational features in the Ravenswood pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster (Bedwell Bayfront Park and SR 84 Bay Trail spine) are outside the project area and would continue to be maintained. Water-based recreation within the ponds is currently prohibited. Use of waterways outside of the ponds would not be permanently removed by this alternative, though flow rates may be higher near breaches.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C, there are currently no existing recreational features in the Ravenswood pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster (Bedwell Bayfront Park and SR 84 Bay Trail spine) are outside the project area and would continue to be maintained. Water-based recreation within the ponds is currently prohibited. Use of waterways outside of the ponds would not be permanently removed by this alternative, though flow rates may be higher near breaches.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Under Alternative Ravenswood D, there are currently no existing recreational features in the Ravenswood pond cluster that are in use or would be permanently removed. Existing levees in the project area are fenced, and access is precluded. Existing trails on many of the levees adjacent to the boundary of the pond cluster (Bedwell Bayfront Park and SR 84 Bay Trail spine) are outside the project area and would continue to be maintained. Water-based recreation within the ponds is currently prohibited. Use of waterways outside of the ponds would not be permanently removed by this alternative, though flow rates may be higher near breaches.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.6-3: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, no new public access or recreation activities would occur under Phase 2, and the pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Recreation uses would remain similar to existing conditions, and would not change in the long term. Therefore, no increased demand or physical deterioration of adjacent facilities would be expected to occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, no new public access or recreation activities would occur under Phase 2, and the Alviso-Island pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Recreation uses would remain similar to existing conditions, and would not change in the long term. Therefore, no increased demand or physical deterioration of adjacent facilities would be expected to occur.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Under Alternative Island C, no new public access or recreation activities would occur under Phase 2 and the pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Recreation uses would remain similar to existing conditions, and would not change in the long term. Therefore, no increased demand or physical deterioration of adjacent facilities would be expected to occur.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, no new public access or recreation features would be completed. Existing trails on many of the levees adjacent to the boundary of the Alviso-Mountain View pond cluster would continue to be maintained. This alternative would not increase recreation use or cause substantial physical deterioration of adjacent recreational facilities.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, new public access and recreational facilities would be provided and would increase recreational enjoyment of the Alviso-Mountain View pond cluster.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

The projected increase in recreation use as a result of project actions is estimated to be approximately 50 to 60 additional users per day during peak periods of use. This incremental increased use is minimal. This alternative would not substantially increase recreation use or cause substantial physical deterioration of adjacent recreational facilities.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, new public access and recreational facilities would be provided and would increase recreational enjoyment of the pond cluster.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

The projected increase in recreation use as a result of this alternative is estimated to be approximately 100 to 150 additional users per day during peak use periods. New trail spurs and viewing platforms are dispersed throughout the project area, and this incremental increased use is minimal. This alternative would not substantially increase recreation use or cause substantial physical deterioration of adjacent recreational facilities.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, no new public access or recreation activities would occur under Phase 2, and the pond cluster would continue to be monitored and managed in accordance with current USFWS practices. Recreation uses (hunting) would remain similar to existing conditions, and would not change in the long term. Therefore, no increased demand or physical deterioration of adjacent facilities would be expected to occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, no new public access or recreation activities would occur under Phase 2 and the pond cluster would continue to be monitored and managed in accordance with current USFWS practices. Recreation uses (hunting) would remain similar to existing conditions, and would not change in the long term. Therefore, no increased demand or physical deterioration of adjacent facilities would be expected to occur.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no new public access or recreation features would be completed. Existing trails at the adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, and the existing Bay Trail along SR 84 would continue to be used and separately maintained.

There would be no increase in recreation use as a result of this alternative, and there would be no impacts on adjacent recreational facilities.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, there would be new recreational facilities in the form of a viewing platform, but no new public access trails would be completed. Existing trails at the adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, and the existing Bay Trail along SR 84 would continue to be used and separately maintained.

There would be no increase in recreation use as a result of this alternative, and there would be no impacts on adjacent recreational facilities.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Under Alternative Ravenswood C, there would be new public access and recreational facilities that would increase recreational enjoyment of the Ravenswood pond cluster. New public access and recreational facilities would be provided and would increase recreational enjoyment of the pond cluster.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of a viewing platform will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

The projected increase in recreation use as a result of this alternative is estimated to be approximately 100 to 150 additional users per day during peak use periods. New trail spurs and viewing facilities are dispersed throughout the project area, and this incremental increased use is minimal. A new trail connection from the Bay Trail along SR 84 would provide an additional access opportunity, and may reduce access demand from the existing trailhead at Bedwell Bayfront Park. This alternative would not substantially increase recreation use or cause substantial physical deterioration of adjacent recreational facilities.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Under Alternative Ravenswood D, there would be new public access and recreational facilities that would increase recreational enjoyment of the pond cluster. New public access and recreational facilities would be provided and would increase recreational enjoyment of the pond cluster.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of a viewing platform, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

The projected increase in recreation use as a result of this alternative is estimated to be approximately 100 to 150 additional users per day during peak use periods. New trail spurs and viewing platforms are dispersed throughout the project area, and this incremental increased use is minimal. A new trail connection from the Bay Trail along SR 84 would provide an additional access opportunity, and may reduce access demand from the existing trailhead at Bedwell Bayfront Park. This alternative would not substantially increase recreation use or cause substantial physical deterioration of adjacent recreational facilities.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.6-4: Result in substantial adverse physical impacts associated with the provision of new or physically altered park and recreational facilities, or result in the need for new or physically altered park and recreational facilities, the construction of which could cause significant environmental impacts.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Under Alternative Island C, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, new recreational facilities would be provided and would increase recreational enjoyment of the pond cluster. Physical impacts would occur related to the improvement of a 700-foot-long portion of an existing levee to increase the levee surface width and elevation sufficient to provide a year-round trail. The impact of implementation of the trail-related components of this levee improvement is minimal when considered in the context of physical impacts associated with levee reconstruction and earthwork as part of the overall project.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

Alternative Mountain View B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Mountain View C. Under Alternative Mountain View C, new recreational facilities would be provided and would increase recreational enjoyment of the pond cluster. Physical impacts would occur related to the improvement of a 600-foot-long portion of an existing levee to increase the levee surface width and elevation sufficient to provide a year-round trail. Physical impacts would also occur related to the construction of a 700-foot-long boardwalk and improvements to the surface of an existing levee road to make it ADA-compliant. Boardwalk construction would be completed within the footprint of an existing levee, utilizing low-impact construction techniques to minimize physical impacts to adjacent lands. The impact of implementation of the trail-related components of this levee improvement is minimal when considered in the context of physical impacts associated with levee reconstruction and earthwork as part of the overall project.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

Alternative Mountain View C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under Alternative A8 B, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no new public access or recreation facilities would be provided under Phase 2. Therefore, there would be no physical impacts associated with construction of park and recreational facilities.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, there would be new recreational facilities, but no additional public access trails. Physical impacts would be limited to the construction of a viewing platform at the edge of the existing developed area. Therefore, there would be minimal physical impacts associated with construction of park and recreational facilities.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Under Alternative Ravenswood C, new recreational facilities would be provided and would increase recreational enjoyment of the Ravenswood pond cluster. Physical impacts would occur from the improvement of a 1,500-foot-long portion of an existing levee to increase the levee surface width and elevation sufficient to provide a year-round trail, construction of a 1,200-foot-long boardwalk, and improvements to the surface of an existing 1,200-foot-long levee to make it ADA-compliant (the levee height would not be elevated). However, even in the absence of the trails, these improvements would be necessary in order to provide protection against tidal flows and to allow management of water quality.

In addition, boardwalk construction would be completed within the footprint of an existing levee, utilizing low-impact construction techniques to minimize physical impacts to adjacent lands. The impact of implementation of trail-related levee improvements is considered minimal when considered in the context of physical impacts associated with levee reconstruction and earthwork as part of the overall project.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

Alternative Ravenswood C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Under Alternative Ravenswood D, new recreational facilities would be provided and would increase recreational enjoyment of the pond cluster. Physical impacts would occur related to the improvement of a 2,700-foot-long portion and a 1,200-foot-long portion of an existing levee to increase the levee surface width and elevation sufficient to provide a year-round trail. However, even in the absence of the trails, these improvements would be necessary in order to provide protection against tidal flows and to allow management of water quality. Construction would be completed within the footprint of existing levees. The impact of implementation of trail-related levee improvements is considered minimal when considered in the context of physical impacts associated with levee reconstruction and earthwork as part of the overall project.

Improved recreation and public access facilities, including accessibility improvements to existing trails, completion of new trail segments, and addition of viewing facilities, will be a beneficial impact to recreation resources. Their provision is consistent with USFWS and BCDC policies to provide public access and wildlife viewing opportunities.

Alternative Ravenswood D Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, no activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Under Alternative Island B, no activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Under Alternative Island C, no activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). No activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, temporary closure of some of the existing recreation facilities will be necessary due to construction of the restoration project elements, flood control, and recreation and public access improvements, including reconstruction of some levees that currently provide public access. The Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and a temporary alternate route to access public facilities, wherever feasible. Some areas will be closed to the public during construction; however, existing alternate recreation features will be available within the vicinity of any temporary closures. All closures will be posted in advance of construction activities, and closure notice materials will direct users to alternate recreation features. A proposed material staging area will be located within the right-of-way of a portion of the Bay Trail in Shoreline Park; however, a detour will be provided throughout construction activities to maintain Bay Trail connectivity.

Similar to the temporary closures of some of these on-land facilities during construction, there would be brief restrictions on water-based recreation in areas immediately adjacent to work on levees (breaching, lowering, or raising) or where boardwalk would be constructed outside of Pond A1. These restrictions would be temporary, and regular recreational use of waterways that allow these uses would resume thereafter.

Although trail connectivity and alternate recreation opportunities will remain throughout construction and public notification of all closures posted as well as alternate recreation opportunities provided, construction activities related to the project will result in the temporary closure of existing trails and recreation facilities; therefore, impacts are significant and unavoidable.

Alternative Mountain View B Level of Significance: Significant and Unavoidable

Alternative Mountain View C. Under Alternative Mountain View C, , temporary closure of some of the existing recreation facilities may be necessary due to construction of the restoration project elements, flood control, and recreation and public access improvements, including reconstruction of some levees that currently provide public access. The Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and a temporary alternate route to access public facilities, wherever feasible. Some areas will be closed to the public during construction; however, existing alternate recreation features will be available within the vicinity of any temporary closures. All closures will be posted in advance of construction activities, and closure notice materials will direct users to alternate recreation features. A proposed material staging area will be located within the right-of-way of a portion of the Bay Trail in Shoreline Park; however, a detour will be provided throughout construction activities to maintain Bay Trail connectivity.

Similar to the temporary closures of some of these on-land facilities during construction, there would be brief restrictions on water-based recreation in areas immediately adjacent to work on levees (breaching, lowering, or raising) or where boardwalk would be constructed outside of Pond A1. These restrictions would be temporary, and regular recreational use of waterways that allow these uses would resume thereafter.

Although trail connectivity and alternate recreation opportunities will remain throughout construction and public notification of all closures posted and alternate recreation opportunities provided, construction activities related to the project will result in the temporary closure of existing trails and recreation facilities; therefore, impacts are significant and unavoidable.

Alternative Mountain View C Level of Significance: Significant and Unavoidable

Alviso-A8 Ponds

Alternative A8 A (No Action). No activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. No activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no activities would occur under Phase 2 that would result in the temporary closure of adjacent public park and recreation facilities.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, temporary closure of some of the existing recreation facilities may be necessary due to construction of the restoration project elements and flood control and recreation improvements, including reconstruction of some levees that currently provide public access. The Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and a temporary alternate route to access public facilities, wherever feasible. Some areas will be closed to the public during construction; however, existing alternate recreation features will be available within the vicinity of any temporary closures. All closures will be posted in advance of construction activities, and closure notice materials will direct users to alternate recreation features.

Similar to the temporary closures of some of these on-land facilities during construction, there would be brief restrictions on water-based recreation in areas immediately adjacent to work on the levees (breaching, lowering, or adding water control structures) around the Ravenswood Ponds. These restrictions would be temporary, and regular recreational use of waterways that allow these uses would resume thereafter.

Although alternate recreation opportunities will remain throughout construction and public notification of all closures posted and alternate recreation opportunities provided, construction activities related to the project will result in the temporary closure of existing trails and recreation facilities; therefore, impacts are significant and unavoidable.

Alternative Ravenswood B Level of Significance: Significant and Unavoidable

Alternative Ravenswood C. Under Alternative Ravenswood C, temporary closure of some of the existing recreation facilities may be necessary due to construction of the restoration project elements, flood control, and recreation and public access improvements, including reconstruction of some levees that currently provide public access. The Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and to provide a temporary alternate route to access public facilities, wherever feasible. Some areas will be closed to the public during construction; however, existing alternate recreation features will be available within the vicinity of any temporary closures. All closures will be posted in advance of construction activities, and closure noticing materials will direct users to alternate recreation features.

Similar to the temporary closures of some of these on-land facilities during construction, there would be brief restrictions on water-based recreation in areas immediately adjacent to work on the levees (breaching, lowering, or adding water control structures) around the Ravenswood Ponds. These restrictions would be temporary, and regular recreational use of waterways that allow these uses would resume thereafter.

Although alternate recreation opportunities will remain throughout construction and public notification of all closures posted and alternate recreation opportunities provided, construction activities related to the project will result in the temporary closure of existing trails and recreation facilities; therefore, impacts are significant and unavoidable.

Alternative Ravenswood C Level of Significance: Significant and Unavoidable

Alternative Ravenswood D. Under Alternative Ravenswood D, temporary closure of some of the existing recreation facilities may be necessary due to construction of the restoration project elements, flood control, and recreation and public access improvements, including reconstruction of some levees that currently provide public access. The Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and to provide a temporary alternate route to access public facilities, wherever feasible. Some areas will be closed to the public during construction; however, existing alternate recreation features will be available within the vicinity of any temporary closures. All closures will be posted in advance of construction activities, and closure noticing materials will direct users to alternate recreation features.

Similar to the temporary closures of some of these on-land facilities during construction, there would be brief restrictions on water-based recreation in areas immediately adjacent to work on the levees (breaching, lowering, or adding water control structures) around the Ravenswood Ponds. These restrictions would be temporary, and regular recreational use of waterways that allow these uses would resume thereafter.

Although alternate recreation opportunities will remain throughout construction and public notification of all closures given and alternate recreation opportunities provided, construction activities related to the project will result in the temporary closure of existing trails and recreation facilities; therefore, impacts are significant and unavoidable.

Alternative Ravenswood D Level of Significance: Significant and Unavoidable

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.6-6. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP and other Refuge management practices. In most cases, the Recreation Resources analysis required no project-level mitigation measures to reduce impacts to levels that would be less than significant. However, for Alternatives Ravenswood A, Ravenswood B, Mountain View A, and Mountain View B, the threshold of significance for Impact 3.6-1 would be crossed because those alternatives would not provide maximum feasible public access. The significance determination for these alternatives under Impact 3.6-1 is Potentially Significant. Also, certain temporary impacts associated with construction activities that include closures and disruptions of popular public access and recreation facilities (Impact 3.6-5 for the Action Alternatives at the Alviso-Mountain View Ponds and the Ravenswood Ponds) there are no feasible mitigation measures to reduce these impacts to less than significant. These would be significant and unavoidable.

Table 3.6-6 Phase 2 Summary of Impacts – Recreation Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.	NI	LTS	LTS	PS	PS	LTS/ B	NI	NI	PS	PS	LTS/B	LTS/B
Phase 2 Impact 3.6-2: Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.6-3: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	LTS	LTS
Phase 2 Impact 3.6-4: Result in substantial adverse physical impacts associated with the provision of new or physically altered park and recreational facilities, or result in the need for new or physically altered park and recreational facilities, the construction of which could cause significant environmental impacts.	NI	NI	NI	NI	LTS/ B	LTS/ B	NI	NI	NI	LTS	LTS/B	LTS/B
Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use.	NI	NI	NI	NI	SU	SU	NI	NI	NI	SU	SU	SU

Notes: Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
B = Beneficial (NEPA only)
LTS = Less than Significant
NI = No Impact,
PS = Potentially Significant
SU = Significant and Unavoidable

3.7 Cultural Resources

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) characterizes the existing cultural resources within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on cultural resources. The information presented is based on a review of existing cultural resources within the area and other pertinent federal, state, and local regulations, which are presented in Section 3.7.2, Regulatory Setting. Section 3.7.1, Physical Setting, is included to establish the origin and environmental and cultural context of the resources. Using this information as context, an analysis of the cultural-resources-related environmental impacts of the project is presented for each alternative in Section 3.7.3, Environmental Impacts and Mitigation Measures. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of the project. Therefore, this section only includes additional, project-level mitigation measures, as needed.

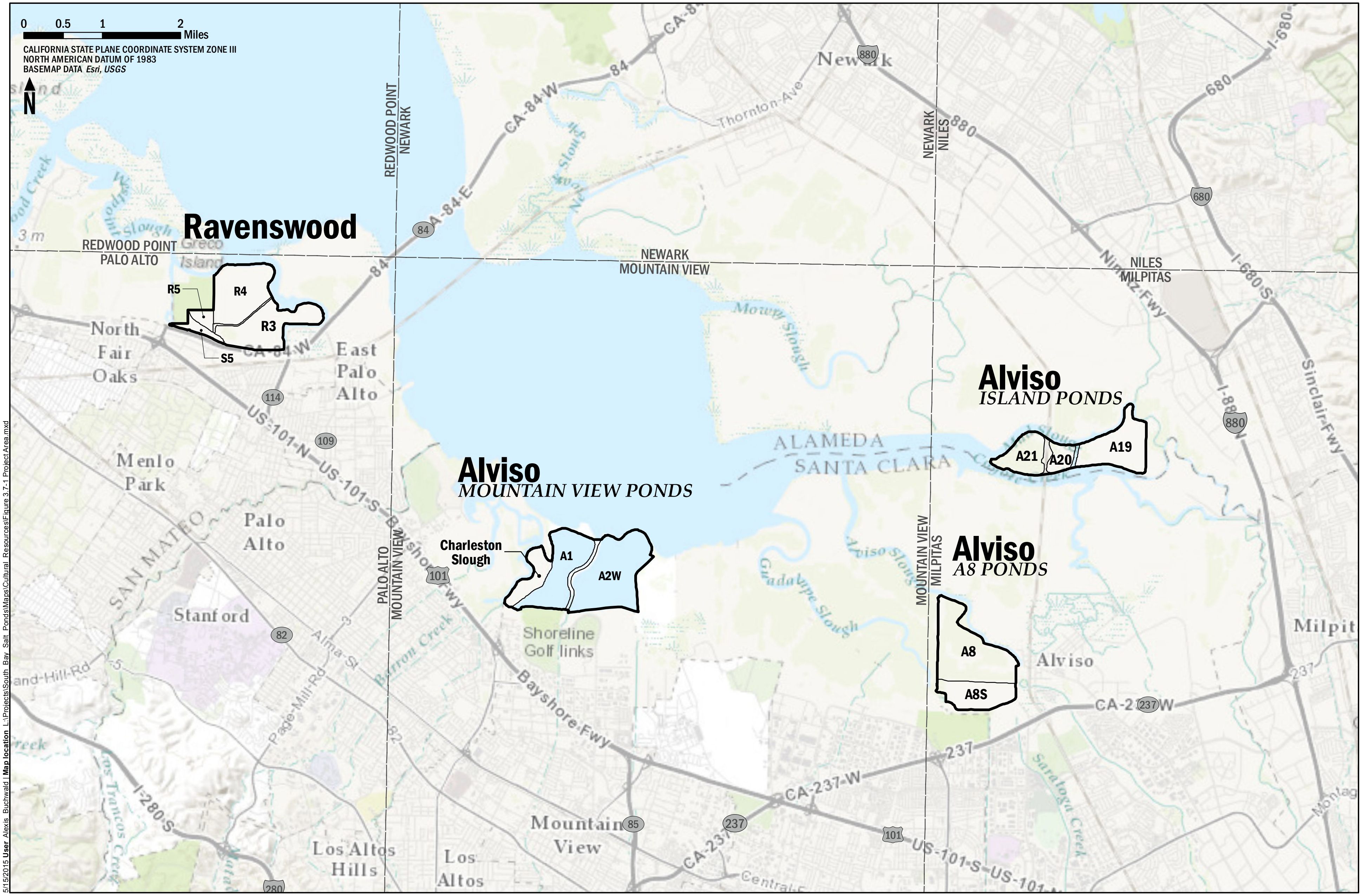
3.7.1 Physical Setting

The South Bay, including the Phase 2 South Bay Salt Pond (SBSP) Restoration Project area, is in portions of San Mateo, Santa Clara, and Alameda Counties and comprises approximately 50,000 acres of shoreline mudflats and marshes as well as low hills and valleys ranging from sea level to approximately 25 feet (8 meters) above mean sea level in elevation. The Phase 2 project area is depicted on three United States Geological Survey (USGS) 7.5-minute topographical quadrangle maps: Palo Alto, Milpitas, and Mountain View (Figure 3.7-1). Vegetation within the project areas consists of marsh species, including cordgrasses, pickleweeds, and other salt-tolerant plant species.

Methodology

Background research, in the form of a record search performed by the Northwest Information Center (NWIC) of the California Historical Resources Information System in Rohnert Park, CA, was conducted in September 2013 (NWIC file 13-0330). As defined by Mitigation Measure 3.8-1 of the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R) (discussed in Chapter 2, Alternatives), new record searches shall be performed for specific projects within the SBSP Restoration Project area where the previous record search is more than 5 years old. The previous record search for the 2007 EIS/R was conducted in 2006. The updated record search covered the Area of Potential Effect (APE) for the Phase 2 SBSP Restoration Project and a ¼-mile search radius to establish a context for the Phase 2 APE. The APE includes the entirety of all ponds affected by the Phase 2 activities. The United States Fish and Wildlife Service (USFWS) is conducting ongoing Section 106 consultation with the California State Historic Preservation Officer (SHPO) for the Phase 2 project.

In addition to the record search, in October and November 2013, URS cultural resource specialists visited portions of the APE that were not previously surveyed and inventoried and revisited the locations of some previously recorded resources to determine whether such resources were still extant. The results of previous surveys—conducted in 2006 and 2007 by USFWS archaeologists and architectural historians for the 2007 EIS/R (2007 EIS/R; Speulda-Drews and Valentine 2007a, 2007b) and 2008 by Basin Research Associates for the Interim Feasibility Study—were also relied on to establish existing conditions.



Phase 2 Project Area
USGS 7.5 minute map boundary

5/15/2015 User Alexis Buchwald | Map location L:\Projects\South Bay Salt Ponds\Maps\Cultural Resources\Figure 3.7-1 Project Area.mxd

URS
South Bay Salt Pond Restoration Project

Figure 3.7-1
Project Area

The purpose of the NWIC search was to determine the location and nature of previously recorded cultural resources within the Phase 2 APE and assess whether cultural resource inventory surveys had been previously conducted within the APE. In addition, the record search and associated background documentary review provides the context for cultural resources in the Phase 2 SBSP Restoration project area.

The NWIC search included examination of information resources such as:

- Office of Historic Preservation Historic Property Directory;
- California Inventory (1996);
- California Historic Landmarks (1996);
- National Register of Historic Places (2000 and updates);
- California Points of Historical Interest (1992 and updates);
- Santa Clara County Heritage Inventory (1975 and 1979); and
- Historic maps.

The NWIC reported that there are four previously recorded cultural resources within the Phase 2 APE (Table 3.7-1). A more detailed description of the various resources may be found in the discussion of the individual pond complexes below. The NWIC also had records of nine cultural resources reports that documented surveys covering portions of the APE (Table 3.7-2). Most of these inventories focused on the southern boundaries of the Mountain View and Ravenswood pond clusters, where the ponds front the modern shoreline, and on the southeastern edge of the A8 pond cluster, near the historic town of Alviso.

Table 3.7-1 Previously Recorded Cultural Resources within the Phase 2 APE

POND CLUSTER	RECORDED RESOURCES	
	PREHISTORIC	HISTORIC-ERA
Alviso-Island Ponds (Ponds A19, A20, and A21)	1	1
Alviso-Mountain View Ponds (Ponds A1 and A2W and Charleston Slough)	0	1
Alviso-A8 Ponds (Ponds A8 and A8S)	0	1
Ravenswood Ponds (Ponds R3, R4, R5, and S5)	0	0

Table 3.7-2 Previous Cultural Resource Inventories within the Phase 2 APE

POND CLUSTER	NUMBER OF INVENTORIES
Alviso-Island Ponds (Ponds A19, A20, and A21)	2
Alviso-Mountain View Ponds (Ponds A1 and A2W and Charleston Slough)	1
Alviso-A8 Ponds (Ponds A8 and A8S)	5
Ravenswood Ponds (Ponds R3, R4, R5, and S5)	1

In addition to the resources and inventory studies reported by the NWIC, the Alviso and Ravenswood pond complexes have been recorded as part of the USFWS's ongoing consultation with the SHPO to resolve adverse effects for the broader SBSP Restoration Project (Speulda-Drews and Valentine 2007a, 2007b). As a part of this recordation, many of the accessible portions of the levees within each pond complex were surveyed. Figure 3.7-2 depicts those areas previously surveyed for the SBSP Restoration Project and those areas surveyed subsequently for the Phase 2 actions.

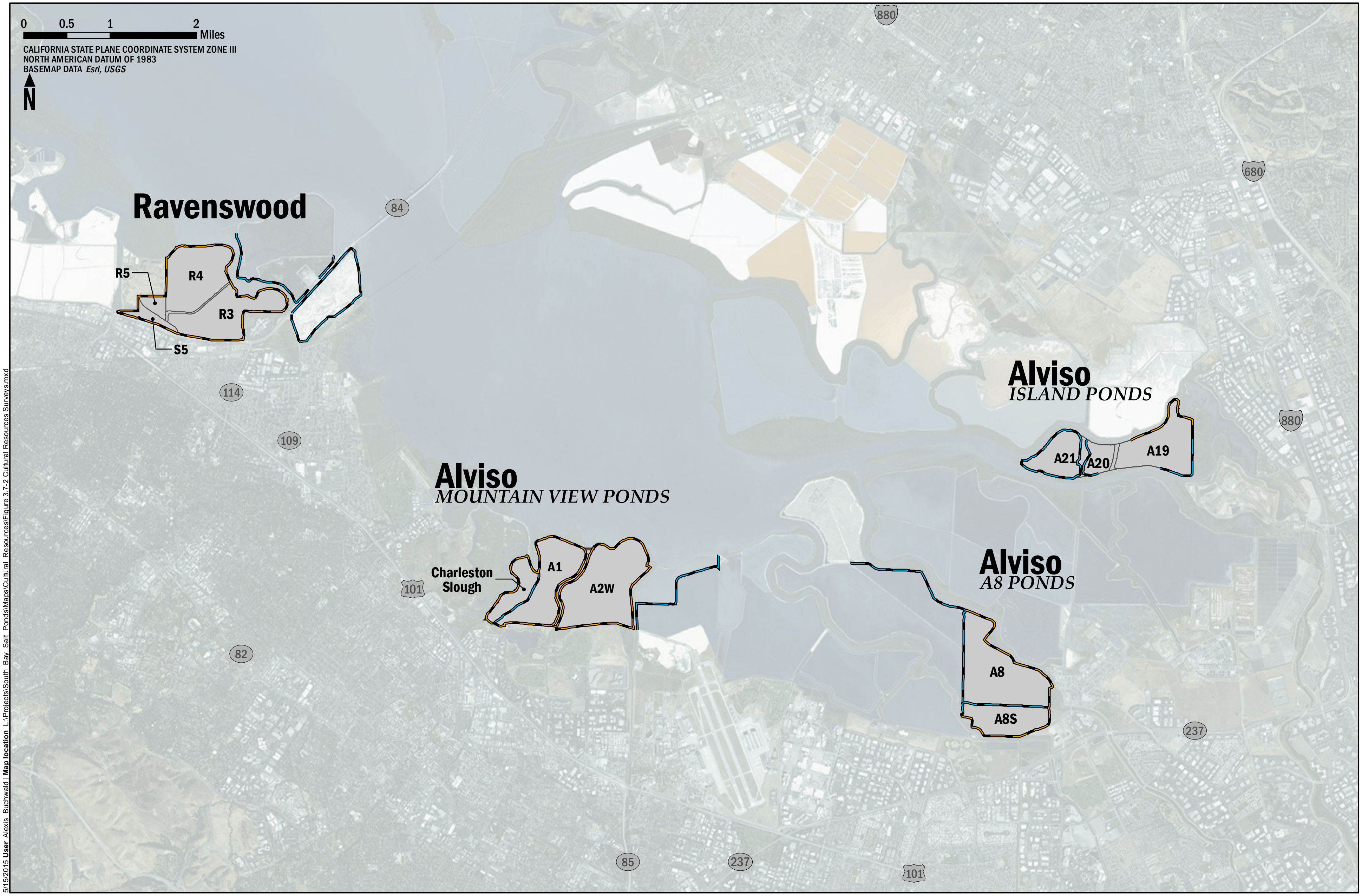
Regional Setting

The 2007 EIS/R contains a thorough explanation of the prehistoric setting, history of archaeological research in the region, ethnographic setting, and historic setting—including the Spanish and Mexican periods, the Gold Rush, and subsequent American development of the South Bay. Although these broad-context statements are useful in understanding the broader historic context of the project area, much of the information is not directly relevant to the specific resources identified within the Phase 2 APE. Brief summaries of the historic contexts are included below, with more attention given to those topics that have direct relevance to an understanding of the resources within the Phase 2 APE. For a more general discussion of the cultural resources setting of the project area, please refer to Section 3.8 of the 2007 EIS/R.

Geomorphic Setting

This brief discussion of soils and geologic units provides a context for both archaeological materials, which have been influenced by geomorphic changes in the Bay Area over the past ca. 13,500 years (roughly the time that humans have occupied California), and paleontological resources (fossils, etc.), which are subsumed under the cultural resources discipline by the California Environmental Quality Act (CEQA). For a more complete analysis of the geologic setting, see Section 3.4, Geology, Soils, and Seismicity. The soils underlying the Phase 2 APE consist of youngest bay mud over semi-consolidated alluvial deposits (Witter et al. 2006). The bay mud ranges from 4 to 23 feet thick within the APE (AMEC 2009). The bay mud within the APE was most likely deposited in the last approximately 4,000 years, as sea levels stabilized and sedimentation at the bay margin began to keep pace with sea-level rise. The bay mud is overlain by Quaternary alluvial sediments of variable lithology, which represent the historic ground surface during the late Pleistocene and early Holocene, prior to inundation of San Francisco Bay (Bay).

The entire southern rim of San Francisco Bay has been heavily used since humans entered the region. Rising sea levels and concomitant sedimentation likely have buried older prehistoric sites. Gold Rush-era placer mining resulted in the deposition of hundreds of cubic meters of sediment around the Bay, likely burying additional prehistoric and early historic sites along the Bay's edge. Agriculture, the salt industry, and other bayshore development have contributed to the destruction or obscuration of evidence of human use.



5/15/2015 User Alexis Buchwald | Map location L:\Projects\South Bay Salt Ponds\Maps\Cultural Resources\Figure 3.7-2 Cultural Resources Surveys.mxd

Phase 2 Survey (URS)
Previous survey (USFWS)
Phase 2 Project Area

URS
South Bay Salt Pond Restoration Project

Figure 3.7-2
Cultural Resources Surveys

Prehistoric Setting

Prehistoric use of the bayshore has been clearly identified, but the density of occupation and use have most likely been underestimated because so many sites have been obscured by the processes noted above. Semi-systematic documentation of the most visible prehistoric resources did not begin until the early twentieth century, by which time it was noted that many mound and shellmound sites had already been damaged or destroyed (Nelson 1909). Prehistoric sites generally cluster in the vicinity of a water source or other relatively obvious resources such as food collection areas (e.g., oak trees) or tool stone deposits. However, being able to predict likely site locations does not mean that they have all been found. Rather, it is assumed that many sites will never be found unless a construction project of some type accidentally uncovers them.

The earliest well-documented entry and spread of humans into California occurred at the beginning of the Paleo-Indian Period (11,500 to 6,000 B.C.). Their social units are thought to have been small and highly mobile. Known sites have been identified in the contexts of ancient pluvial lake shores and coastlines, as evidenced by such characteristic hunting implements as fluted projectile points and chipped stone crescent forms. Few archaeological sites have been found in the Bay Area that date to the Paleo-Indian or the ensuing Lower Archaic (6,000 to 3,000 B.C.) periods. The lack of sites from earlier periods may be because of high sedimentation rates (inundation of the bay by the Pacific Ocean and the associated alluvial deposition), leaving the earliest sites deeply buried and inaccessible.

During the Middle Archaic Period (3,000 to 500 B.C.) the broad regional patterns of foraging subsistence strategies gave way to more intensive procurement practices. Populations were growing and occupying more diverse settings. Permanent villages that were occupied throughout the year were established, primarily along major waterways, including the establishment of the first shellmound sites along the Bay shore. The current body of archaeological evidence indicates that the mounds served multiple purposes as residential places, ceremonial locations, and burial sites with many diverse and complex aspects.

The onset of status distinctions and other indicators of growing sociopolitical complexity mark the Upper Archaic Period (500 B.C. to A.D. 700). Exchange systems become more complex and formalized and evidence of regular, sustained trade between groups was seen for the first time. Several technological and social changes characterized the Emergent Period (A.D. 700 to 1800). The bow and arrow were introduced, ultimately replacing the dart and atlatl. Territorial boundaries between groups became well established. It became increasingly common that distinctions in an individual’s social status could be linked to acquired wealth. Exchange of goods between groups became more regularized with more goods, including raw materials, entering into the exchange networks. In the latter portion of this period (A.D.1500 to 1800), exchange relations became highly regularized and sophisticated. The clamshell disk bead became a monetary unit for exchange, increasing quantities of goods moved greater distances, and vocational specialists arose to govern various aspects of production and exchange.

Ethnographic Setting

At the time of European contact, the Phase 2 SBSP Restoration Project area and its vicinity were occupied by Costanoan, also known as Ohlone, tribal groups. For a discussion of the lifeways and history of these groups, please refer to the 2007 EIS/R.

Historic Setting

In addition to the historic context developed for the 2007 EIS/R, a very in-depth history of the South Bay salt works has been developed in a separate document: *Historic Context of the South Bay Salt Pond Restoration Project* which was an appendix to the 2007 EIS/R (EDAW 2005). The report focuses on the conversion of the salt marshes and development of salt ponds, the rise of the salt industry, and the types of features and structures associated with this industry. Given that most of the identified historic-era resources in the APE are associated with this history, portions of that context are included in the following sections. However, for a more complete discussion of the historic context, please refer to the EDAW 2005 document, available online: http://www.southbayrestoration.org/documents/permit-related/Historic%20Salt%20AppendixD.pdf

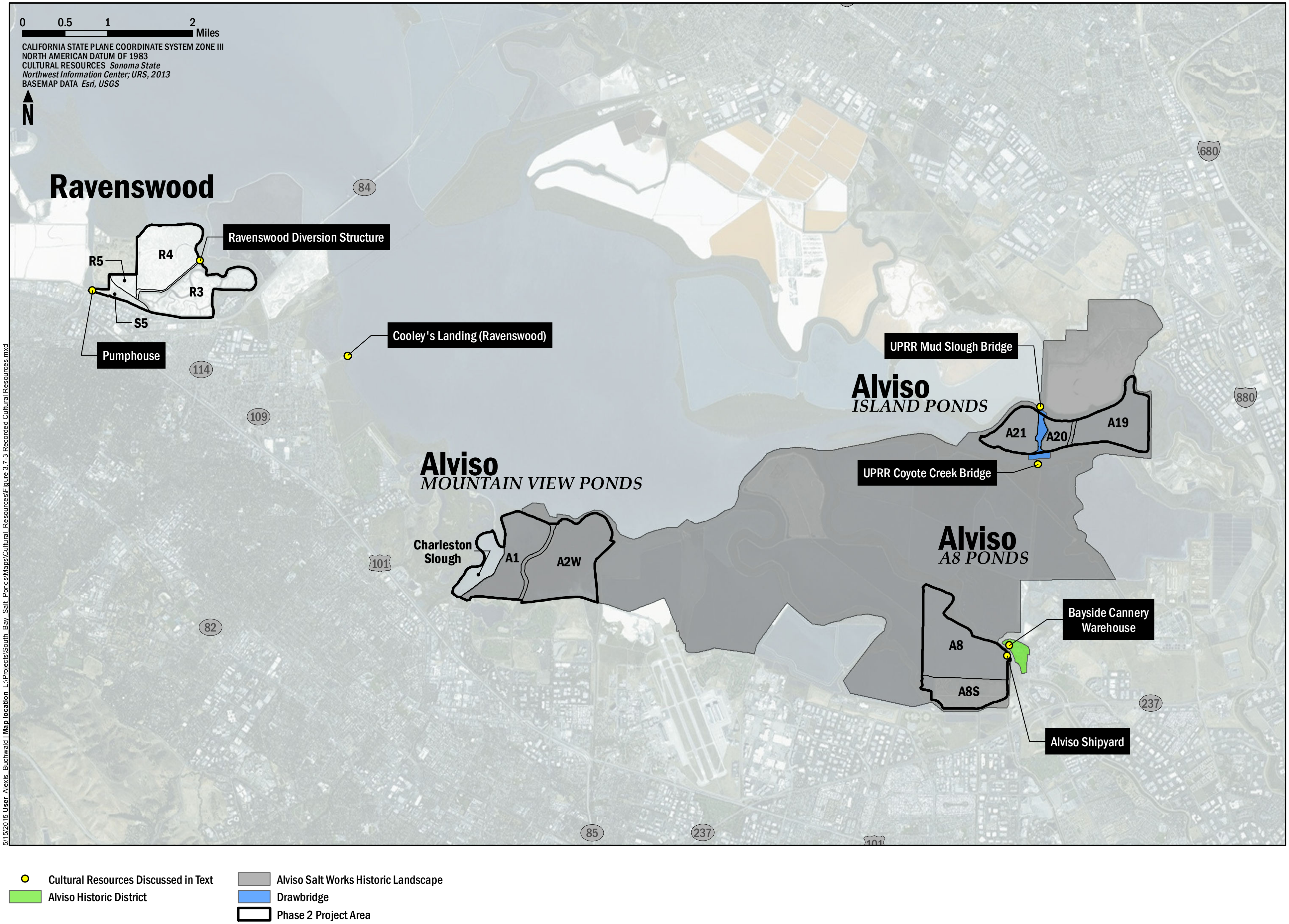
Spanish and Mexican Periods

Soon after the establishment of Mission San Francisco de Asís by Juan Bautista de Anza in San Francisco in 1776, Jose Joaquin Moraga and Fray Tomas de la Pena set out to establish Mission Santa Clara de Asís along the Guadalupe River (Payne 1987). The Santa Clara Valley was a prime location for a mission because of its mild winters and long growing season for crops. The first mass at the Mission Santa Clara de Asís was held on January 12, 1777 (Payne 1987). Another three missions were built in the Santa Clara Valley: Santa Cruz (1791), San Jose (1797), and San Juan Bautista (1797). The missions were self-sustaining, raising a variety of grains and crops as well as sheep and cattle. Each mission also had its own shipping port to expedite the trading and selling of goods.

Mexico achieved independence from Spain in 1821, and in 1822 California was declared a territory of the Mexican republic. In 1834, the Mexican government secularized the missions and divided their land holdings into ranchos; portions of several ranchos are in the project area. Ranchos within or adjacent to the Phase 2 APE are Agua Caliente (Alviso-Island Ponds) in Alameda County; Pastoria de las Borregas, and Rincon de San Francisquito (Alviso-Mountain View Ponds) in Santa Clara County; and Rincon de los Esteros (Alviso-A8 Ponds) and Rancho de las Pulgas (Ravenswood Ponds) in San Mateo County (Beck and Haase 1974). During this time, Americans also began migrating to Alta California, and tensions rose as the new settlers began to occupy the rancho lands. The Mexican War of 1846 ended with the signing of the Treaty of Guadalupe Hidalgo in February 1848 and the cession of California to the United States.

American Period Industry and Transportation

Before 1860, the main forms of transportation throughout the San Francisco Bay region were boat and stagecoach. A maritime transportation network grew up around the economy of the Bay Area to facilitate the movement of agricultural products. The Port of Alviso was one of the earliest ports in the Bay Area. By 1861, a steamboat company and four sail companies operated out of Alviso. Other shipping centers developed in the Bay Area, including a minor port at Ravenswood, southeast and outside of the Phase 2 Ravenswood pond cluster APE (Figure 3.7-3).



URS
South Bay Salt Pond Restoration Project

Figure 3.7-3
Recorded Cultural Resources

The most obvious evidence of human occupation in the project area is the various salt works structures and remnants, ditches and levees, the salt ponds themselves, and the detritus (historic and modern) that has collected around them. The Phase 2 SBSP Restoration Project area is clearly part of a larger, contiguous complex that lines almost the entire southern rim of San Francisco Bay. The Alviso Salt Works was determined to retain sufficient integrity to be considered a cultural landscape, as defined by the National Park Service (NPS), and to meet the eligibility criteria for listing to the National Register of Historic Places (NRHP) (and, by extension, to the California Register of Historical Resources [CRHR]) (see the definition of a cultural landscape in Section 3.7.2, Regulatory Setting).

The first construction of levees to create artificial salt ponds in the Bay Area was completed by John Johnson in 1853 (Watt 2005). San Francisco Bay, with its natural tidal marshlands, was a prime environment to be modified for the mining of salt. By the late nineteenth century, most of the East Bay shoreline south of San Lorenzo Creek had been converted to salt ponds. In 1901, the Leslie Salt Refining Company was established; later it would grow to become the largest salt-producing company in San Francisco. For a complete discussion of the evolution of the salt industry in the South Bay and associated features of this industry on the landscape, see the EDAW 2005 report referenced earlier in this section (http://www.southbayrestoration.org/documents/permit-related/Historic%20Salt%20AppendixD.pdf).

Three particular historic locations present within or adjacent to the Phase 2 pond clusters are discussed briefly below to provide context for the recorded resources associated with the pond clusters.

***Alviso*.** Originally known as Embarcadero de Santa Clara, Alviso is located along the outlet of the Guadalupe River into the Bay and directly east of the Phase 2 Alviso A8 pond cluster (Figure 3.7-4). The Embarcadero de Santa Clara was one of the principal landings for Mission Santa Clara and was a prosperous shipping port, sending hides, tallow, grains, and redwood to San Francisco. The port at Alviso was established in 1840 within the land grant and served the increasing trade coming up the Guadalupe River and surrounding sloughs. The increase in trade was partially a result of the development of the mercury mines at New Almaden in response to the use of mercury to help separate gold from its matrix in the gold fields.

In 1849 the community of Alviso was laid out and the plan was for Alviso to become a large, active shipping and commercial center. In 1850, regular steamboat service between San Francisco and Alviso was established. During the 1850s, Alviso became the major north-south passenger and freight link between San Francisco and the South Bay. From the dock, a stagecoach would take travelers to San Jose. The economic importance of Alviso led to the development of docks, warehouses, and homes. In 1852, Alviso incorporated and became one of the first cities in California. However, in 1864, the new San Francisco-San Jose Railroad (now Southern Pacific Railroad) bypassed Alviso and the town began to decline. In 1876, the South Pacific Coast Railroad was built and did stop in Alviso, but residents and business owners resisted the construction of a depot, because they blamed the railroad for the town's downfall.

Phase 2 Project Area

5/15/2015 User Alexis Buchwald | Map location L:\Projects\South Bay Salt Ponds\Maps\Cultural Resources\Figure 3.7-4 Historic map.mxd

URS
South Bay Salt Pond Restoration Project

Figure 3.7-4
USGS Map 1873

A minor industrial resurgence occurred in the town in 1906, when Thomas Foon Chew opened the Bayside Canning Company (Kyle 2002). By 1921, the Bayside Canning Company was the third largest in the United States. The Bayside Canning Company was Alviso's most successful operation, and it employed hundreds of workers, many of whom lived in company-owned housing nearby. The cannery slowed production during the Great Depression and Chew passed away in 1931. In 1936, the cannery closed for good.

Numerous early attempts to reclaim tidal lands around Alviso, including portions of the A8 pond cluster, between the 1890s and 1910s apparently failed. All evidence points to the area being used primarily for duck hunting, fishing, and boating until the 1920s. The Alviso Salt Company, which operated on land that extended from Alviso west to Mayfield Slough, and the Arden Salt Company, which operated on land that extended east and north from Alviso up toward Dumbarton point, appear to have built levees, developed salt ponds, and harvested salt from these lands during the 1920s; many of the levees we still see in the Alviso pond complex today were most likely constructed by 1929. Arden acquired Alviso Salt in that same year, including its plant near the town of Alviso, which had only been used for 1 year. Leslie Salt became the sole operator in the Alviso pond complex after 1936 (Watt 2005). Alongside these salt works, a small World War II naval shipyard was operated by the Woolridge Manufacturing Company on the eastern edge of the A8 Ponds, but was demolished soon after the war.

Drawbridge. The town of Drawbridge is in the Alviso-Island pond cluster on Station Island, between Ponds A20 and A21 (Figure 3.7-3). In 1876, the bankrupt Santa Clara Valley Railroad was purchased and expanded to connect Newark and Santa Cruz to the existing line between Alviso, San Jose, and Santa Clara (Dewey 1989). The new South Pacific Coast Railroad was an important influence on the development of the South Bay, including Drawbridge. When construction of the railroad bridge over Coyote Creek was completed in 1876, a one-room cabin was left for the company's bridge tender, and that cabin became the beginning of Drawbridge. Drawbridge, as an area with an abundance of waterfowl, fish, and shellfish, was an attraction to sportsmen. Numerous duck hunter's cabins were built, the first of which was the Gordon Gun Club in 1880. In 1894, the first residence was built on the island, and in 1897 the railroad officially named the stop "Drawbridge." In 1902, the Sprung Hotel opened and Drawbridge "developed a reputation as a sporting town outside the law, with gambling, drinking and prostitution" (Morrow 1986). Hunter's Home, another hotel, was on the south side of the island. Drawbridge reached its peak in popularity in the 1920s. By 1926, there were 90 cabins, assorted outhouses, sheds, catwalks, boat houses, and water towers and five passenger trains each day. Electricity arrived on the island in 1931, though the only phone was in the railroad station. There was no school, library, post office, city hall, police station, or firehouse. The homes were set on pilings above the marsh and catwalks led from each house to the bed of the railroad track (Morrow 1986).

Residents of Drawbridge continued to occupy their homes until the late 1930s and early 1940s. The deterioration of the natural surroundings and wildlife, along with the growth of San Jose and Newark, contributed to the decline of the settlement. Abandonment and diking of the slough also contributed to the town's decline. By 1939, Mud Slough was navigable only by Coast Guard and USGS boats (Morrow 1986). The diking of several of the surrounding marshes by Leslie Salt effectively cut off access to Drawbridge. After that, the only way to access the town was by way of the railroad tracks. Drawbridge became home to only a handful of people, as most homes were abandoned and duck hunting clubs closed. Vandalism and arson increased in the 1960s and by 1979, the last resident moved away from Drawbridge.

As discussed in the 2007 EIS/R, although no buildings in Drawbridge have been formally evaluated for the NRHP or the CRHR, it appears that the integrity of the remaining architectural elements may not rise to a level that would make them eligible for the NRHP or the CRHR. In 1978, a student crew from the Department of Anthropology, California State University, Hayward, completed a survey of the town and documented the town's history (Morrow 1978). In 1984, a dissertation was completed on the town, including an analysis of its architecture (Morrow 1984).

Ravenswood. Ravenswood was established in 1849 by Isaiah Woods, who led a group of investors that constructed the first buildings and a wharf at the end of Bay Road, in present-day East Palo Alto. The subdivision was the first planned community in San Mateo County and was sited along the proposed route of a new railroad line by the Pacific and Atlantic Railroad Company. The pier constructed by Woods and his partners was an attempt to establish the new town as a commercial port that would rival San Francisco. However, their plans were never realized, as the promised railroad was never constructed (Baxter, Allen, and Hylkema 2007). In 1867, Lester Cooley, who found his initial success delivering water from his well in San Francisco, purchased the unused and apparently dilapidated wharf at Ravenswood and over 400 acres of bayfront property. Cooley repaired the pier, which then became known as Cooley's Landing. The pier began to serve as a loading point for shipping grain and other goods to San Francisco. One locally made commodity was bricks that were manufactured by Hunter, Shackleford and Company, established in 1874. Due in part to its new-found status as a manufactory and shipping port, Ravenswood prospered and became part of Menlo Park when it was incorporated in 1874 (Baxter, Allen, and Hylkema 2007).The Phase 2 Ravenswood pond cluster is approximately 1 mile northwest of the original site of Ravenswood and is not associated with the early history described above. The Ravenswood pond cluster began to be developed for salt production by during the 1910's, after salt works developed in other portions of the South Bay. After other smaller local salt companies (e.g., West Shore Salt Company and Redwood City Salt Company) were consolidated under Leslie Salt (Speulda-Drews and Valentine 2009), Leslie Salt continued to develop the Ravenswood ponds into the 1940's.

Project Setting

Alviso Ponds

The three Phase 2 pond clusters in the Alviso pond complex—the Island Ponds, the Mountain View Ponds, and the A8 Ponds—are all part of the larger Alviso Salt Works Historic Landscape. Cultural resources and identification efforts for each cluster are discussed individually below. The larger Alviso pond complex, to which the Phase 2 clusters are contributing elements, was evaluated by USFWS for NRHP eligibility as a historic salt works landscape.

It was determined that the complex retains sufficient integrity and that it meets

> "eligibility standards at the local level Under Criterion A [association with significant events] because it is associated with the twentieth century period of industrialization when one operator created a vast network of evaporation ponds. The large exterior levees and vast ponds are a signature of the Alviso Unit solar salt landscape. The Alviso Salt Works is a good example of the solar salt industry during the zenith of industrialization." (Speulda-Drews and Valentine 2007a:6)

The SHPO concurred with this determination of eligibility in 2010 (OHP 2010:2).

Numerous smaller cultural features, such as hunting blinds, landings, and piers were also identified by USFWS during surveys of the Alviso pond complex in 2007. The SHPO determined that these smaller features lacked integrity and were considered non-contributing elements of the historic landscape.

Island Ponds. Two previously recorded cultural resources are within the APE for the Phase 2 Island pond cluster. The former town of Drawbridge (see discussion above) has been designated as primary number P-01-003291. The first official recordation of the town occurred in 1974; at that time, it was noted that all of the buildings had been abandoned except for nine hunting shacks. Drawbridge was subsequently documented more thoroughly as part of a dissertation (Morrow 1984). More recently, the town site was included in the 2007 USFWS surveys for the Alviso Salt Works historic district (Speulda-Drews and Valentine 2007a). In the 2007 EIS/R, it was concluded that the town has been slowly sinking into the marsh and that many of the buildings have been burned or vandalized or have collapsed. Drawbridge is listed on the OHP Historic Property Data File under status code 7R (identified in reconnaissance-level survey, but not evaluated for NRHP or CRHR eligibility).

The second cultural resource within the APE for the Phase 2 Island pond cluster is CA-ALA-338 (P-01-002057). This resource was recorded in 1980 as the remnants of a prehistoric shell midden site, observable in the levee of Pond A19. At the time, the site was recorded as being extensively disturbed and consisting of shell (clam, oyster, mussel, and California horn shell) with limited charcoal; no other cultural constituents were observed. The recorded site location was revisited by URS archaeologists in September 2013 (Rehor 2013). Although a variety of shell was observed on the levee, as previously described, there is no indication that this shell has been culturally modified (e.g., heat affected, crushed). Most of the shell observed was either whole or very large fragments. There was no indication of charcoal, midden soil, lithic debitage, or rock of any kind. No obvious cultural constituents were present, save for the man-made levee itself. The levee is constructed of gray bay mud, excavated from the adjacent salt pond, and includes very large thick salt concretions that were also dug up and redeposited with the Bay Mud. It appears that any shell present on or within the levee was naturally occurring in the Bay Mud and redeposited as part of the levee construction. It is very unlikely that a prehistoric archaeological site is present in this location. Examination of the original 1909 Nelson map of Bay Area shellmounds shows that he plotted mound #338 (CA-MNT-338) several thousand feet east of the location of Pond A19, and outside of the Phase 2 APE.

In addition to the two previously identified cultural resources within the APE for the Phase 2 Island pond cluster, two previously recorded resources are directly adjacent to the APE and, as such, are briefly discussed here. These two resources are the railroad bridge across Mud Slough, just north of Drawbridge and the APE, and the railroad bridge across Coyote Creek (P-01-010205), just south of Drawbridge and the APE (Figure 3.7-3). Both of these bridges are swing bridges, which allow for boat traffic, and both have been previously evaluated for eligibility to the NRHP. In 1987, the Union Pacific Railroad (UPRR) bridge over Mud Slough was determined to have a high degree of historic integrity but was recommended as ineligible based on a lack of direct association with historic events or people and because it does not represent a distinctive type or form of construction (Snyder 1987). Since that evaluation, the bridge has undergone major renovations, including removal of the original shack that housed the bridges motor, and lacks the integrity that it had in 1987. The UPRR bridge over Coyote Creek was similarly determined to lack integrity or association, having been completely replaced in 1905, 1948, and 1998 (Hill 1998); and is listed on the OHP Historic Property Data File under status code 6Y (determined ineligible for the NRHP by consensus through Section 106 process, but not evaluated for CRHP or local listing).

Mountain View Ponds. The APE for the Phase 2 Mountain View pond cluster does not contain any known cultural resources. The entire western levee of Pond A1 was subject to pedestrian survey as part of the USFWS landscape investigation (Speulda-Drews and Valentine 2007a). During that survey, at least 13 hunting blinds (nine in Pond A1 and four in Pond A2W), two boat launches (all in Pond A1), and three water control structures (all in Pond A1) were recorded. As discussed above, all of these were considered to lack integrity, were non-contributing elements of the historic salt works landscape, and were not considered historical resources or historic properties.

The remainder of the accessible portions of the Mountain View ponds within the Phase 2 APE were subject to pedestrian survey by URS cultural resource personnel in November 2013 (Figure 3.7-2). These accessible portions included additions to the APE since definition of the Programmatic APE, including portions of Charleston Slough. USFWS is consulting with the SHPO on these Phase 2 APE modifications. No additional cultural resources were identified during the Phase 2 pedestrian surveys or background research.

A8 Ponds. Site CA-SCL-810H is on the eastern edge of Pond A8, along Alviso Slough. The site consists of the disturbed remnants of a historic ship-building facility at the Port of Alviso, which operated during World War II (see discussion above). Most of the building materials appear to have been salvaged after the facility closed. Concrete crane footings and floors, piers, and a boat ramp still remain. Large amounts of modern concrete rubble cover the remaining portions of the site. Effects to this resource were addressed under the Phase 1 actions in the 2007 EIS/R. Previous analysis of the site in the 2007 EIS/R found that the site had lost the integrity that would make it eligible for listing to the NRHP or CRHR.

In addition to the one previously identified resource (CA-SCL-810H), an 1873 historic map of the area depicts a “warehouse” along a minor slough in the southern portion of Pond A8S (Figure 3.7-4). No evidence of this warehouse has been identified in previous studies. The majority of the levees surrounding and between the A8 Ponds have been subjected to previous pedestrian surveys (Guedon 1998; Speulda-Drews and Valentine 2007a; Woodward-Clyde 1998). The remainder of the accessible portions of the A8 Ponds in the Phase 2 APE was subject to pedestrian survey by URS cultural resource personnel in November 2013 (Figure 3.7-2). No cultural resources were identified.

Ravenswood Ponds

The APE for the Phase 2 Ravenswood pond cluster does not contain any known cultural resources. Only a portion of the southern levee, fronting the Bayfront Expressway, was subject to previous cultural resources investigations (Kaptain 2009). All accessible portions of the Ravenswood Ponds within the Phase 2 APE were subject to pedestrian survey by URS cultural resource personnel in November 2013 (Figure 3.7-2). These portions included additions to the APE since definition of the Programmatic APE, including small portions of the Bayfront Canal and Flood Slough. USFWS is consulting with the SHPO on these Phase 2 APE modifications.

The larger Ravenswood pond complex, of which the Phase 2 pond cluster is a significant portion, was evaluated by USFWS for NRHP eligibility as a historic salt works landscape. It was determined that the pond complex lacks integrity and “does not convey a strong association with the salt industry, thus it does not meet the NRHP eligibility criteria for determination as a historic property” (Speulda-Drews and Valentine 2007b:11). The SHPO concurred with this finding in 2010 (OHP 2010:2).

As shown on Figure 3.7-5 (Photos 1 and 2), two built environment resources were identified during field surveys for the Phase 2 activities. These two resources were a small pumphouse at the western edge of Pond S5 and a large water diversion and pump structure at the head of the All-American Canal (AAC), between Ponds R3 and R4.

Figure 3.7-5 Ravenswood Ponds Built Resources

Photo 1. North and west elevation of Pond S5 pumphouse

Photo 2. Ravenswood diversion structure (view to northwest)

The Pond S5 pumphouse is a circa 1940s structure made of dimensional lumber, clad in lap siding, and set on pilings. Aerial photographs indicate that the structure was built between 1943 and 1948. The materials and function of the structure have been modified over time. Extensive modern repairs, inconsistent with the original materials, are evident, including a new composite roof. The pump and the motor housed in the structure were removed, rebuilt, and reinstalled about 12 years ago. The pump station was originally installed to move pickle brines from Pond S5 into the Redwood City Plant Site pickle ponds. The structure now serves as a telecommunication station, with a repeater on the building to communicate with other Cargill field pumps. As such, the structure appears to lack integrity. Given the utilitarian nature of the structure, it does not represent a unique style or work of a master. The only potential significance of the pumphouse would be its association with a larger historic salt works landscape. Given that the Ravenswood unit has been determined to be not eligible as a historic landscape or historic property (as discussed above), the pumphouse would not be eligible as a contributing resource. Therefore, it does not appear to be eligible to the NRHP or CRHR.

The large AAC water diversion and pump structure was originally built early in the development of the Ravenswood salt works to move water and brine between the canal and Ponds R3 and R4. The diversion structure consists of two wooden sluice boxes to transfer water between the ponds and canal, associated hand-turned control gates, and a large platform on creosote pilings fitted with a newer electric pump and steel pipeline. As with the pumphouse discussed above, maintenance and modified use have caused changes in the materials and appearance of the structure. As with the pumphouse, the structure does not appear to represent a unique style of construction or work of a master and would only be potentially eligible for the NRHP or CRHR as a contributing element of a larger historic landscape. As such, the AAC diversion and pump structure does not appear eligible.

3.7.2 Regulatory Setting

A number of federal, state, regional, and local regulations have been established to protect cultural resources and preserve them for future generations. In California, the two most applicable sets of legislation include Section 106 of the National Historic Preservation Act (NHPA) (Section 106), and CEQA.

Federal Regulations

Section 106 requires federal agencies to take into consideration the potential effects of proposed undertakings on historic properties, and to allow the Advisory Council on Historic Preservation the opportunity to comment on a proposed undertaking. Historic properties are cultural resources listed on or considered eligible for inclusion in the NRHP. The regulations implementing Section 106[1] are promulgated by the Secretary of the Interior, as codified in Title 36 Code of Federal Regulations (CFR) Part 800.

Section 106 requirements apply to properties both on the NRHP and not formally determined eligible but that are considered to meet the eligibility requirements (may include situations where SHPO arrives at a consensus regarding a historic property). This consensus may be reached through the provisions of a Programmatic Agreement or other such document or may result from case-by-case consultation. The NHPA authorizes the Secretary of the Interior to maintain and expand a National Register of districts, sites, buildings, structures and objects of significance in American history, architecture, archaeology, engineering and culture. A property may be listed in the NRHP if it meets criteria for evaluation as defined in 36 CFR 60.4:

[1] Documents that include the full text of Section 106 and guidance on working with its provisions may be found at http://www.achp.gov/work106.html.

The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

a. That are associated with events that have made a significant contribution to the broad patterns of our history; or

b. That are associated with the lives of persons significant in our past; or

c. That embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. That have yielded, or may be likely to yield, information important in prehistory or history.

There is also a requirement for an APE map, as described in Section 106 and codified in Title 36 CFR 800.4(a)(1). USFWS submitted a letter to the SHPO on July 16, 2004, requesting confirmation of the APE map for the SBSP Restoration Project. The APE map designates the SBSP Restoration Project boundary, as shown on Figure 1-2 of the 2007 EIS/R, as the Project's APE. The SHPO sent a letter to USFWS dated November 19, 2004, indicating that the agency concurred with USFWS's determination of the project's APE.

The Section 106 review process occurs in four steps: initiation of the process; identification of historic properties; assessment of adverse effects; and resolution of adverse effects. Public involvement, particularly from Native Americans, is strongly encouraged during each of these steps.

Cultural Landscapes

As discussed above, the SBSP Restoration Project area is a heavily modified environment that has been evaluated as a historic cultural landscape, representative of the late-nineteenth- and early-twentieth-century development of industrial salt production along the south San Francisco Bay shore. Project goals to reestablish tidally influenced salt marsh are intended to change the existing landscape, in direct contradiction to the many years of human-made modifications. To properly document, assess, and evaluate cultural landscapes, USFWS uses the NPS guidelines. These guidelines provide standards for undertaking a cultural landscape analysis, including procedures for identifying, evaluating, and managing cultural landscapes in the United States.

The South Bay Salt Pond Restoration Project Historic Context Report (EDAW 2005) was used in conjunction with an evaluation framework developed in consultation with the SHPO to determine the significant features of the solar salt industry landscape. As discussed above, the determination was made that the Alviso Salt Works ponds, as a whole, constitute a Historic Landscape with the primary contributing elements being the ponds themselves, whereas the Ravenswood Salt Works ponds do not constitute a Historic Landscape. The SHPO has concurred with a finding of adverse effect on the Alviso Salt Works Historic Landscape, which is considered a historic property under Section 106, and Historic American Landscape Survey (HALS) documentation has been undertaken as mitigation for effects to this historic landscape. For a more complete description of NPS guidelines and definitions with regards to cultural landscapes, please refer to the 2007 EIS/R.

State Regulations

California Environmental Quality Act

CEQA offers directives regarding impacts on historical resources, unique archaeological resources, and unique paleontological resources. CEQA states generally that if implementation of a project would result in significant environmental impacts, then public agencies should determine whether such impacts can be substantially lessened or avoided through feasible mitigation measures or feasible alternatives. This general mandate applies equally to significant environmental effects related to certain cultural resources.

Only significant cultural resources (e.g., “historical resources” and “unique archaeological resources”) need to be addressed. The CEQA Guidelines (AEP 2014) define a “historical resource” as, among other things, “a resource listed or eligible for listing on the CRHR (CEQA Guidelines, Section 15064.5, subd. (a)(1); see also Public Resources Code Sections 5024.1, 21084.1). A historical resource may be eligible for inclusion on the CRHR, as determined by the State Historical Resources Commission or the lead agency, if the resource:

(1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage; or

(2) Is associated with the lives of persons important in our past; or

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

A resource is presumed to constitute a “historical resource” if it is included in a “local register of historical resources” unless “the preponderance of evidence demonstrates that it is not historically or culturally significant” (CEQA Guidelines, Section 15064.5, subd. (a)(2)). In addition, the CEQA Guidelines requires consideration of unique archaeological sites (Section 15064.5). (See also Public Resources Code Section 21083.2.) A “unique archaeological resource” is defined as: “an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.” (Section 21083.2(h))

If an archaeological site does not meet the criteria for inclusion on the CRHR but does meet the definition of a unique archaeological resource as outlined in the Public Resource Code (Section 21083.2), it is entitled to special protection or attention under CEQA. Treatment options under Section 21083.2 of CEQA include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation.

CEQA also requires assessment of impacts to paleontological resources. Although CEQA does not define what "a unique paleontological resource or site" is, the definition of a unique archaeological resource described above is considered equally applicable to recognizing a unique paleontological resource. CEQA Section 15064.5 (a)(3)(D), which indicates "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history," provides additional guidance.

Public Resources Code Section 15064.5(e) of the state CEQA Guidelines requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, Section 15064.5(d) of the CEQA Guidelines directs the lead agency to consult with the appropriate Native Americans as identified by the NAHC and directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

Under California's Public Resources Code (Section 6316), title to all abandoned shipwrecks, abandoned archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is under the jurisdiction of the California State Lands Commission. The Commission would be consulted with if any cultural resources are discovered on State lands during construction. Further, the final disposition of archaeological, historical, and paleontological resources recovered on State lands under the Commission's jurisdiction must also be approved by the Commission.

Regional/Local Regulations

Due to the large, multi-county, multi-municipality nature of the SBSP Restoration Project, there are naturally many individual county and city plans and policies that apply to cultural resources. They all generally encourage preservation and protection of cultural resources when practicable.

Alviso Pond Complex

City of Fremont. The City of Fremont General Plan (City of Fremont 2003) includes the following relevant cultural resources goals, policies, and implementation measures:

> **Fundamental Goal 13: Vital connections between the history and heritage of the community and everyday life.**
>
> Policy LU 7.3: The City shall identify and designate historic buildings and archaeological sites outside of the identified Historic Overlay district. It is the intent of the City to require, where feasible, the preservation or Primary Historic Resources, as identified in the General Plan. It is the policy of the City of Fremont to protect, enhance, perpetuate and use structures, sites and areas which are reminders of past eras, events, and persons important in local, State, or National history. Resources which provide significant examples of architectural styles of the past and are unique and irreplaceable assets to the community should be protected to provide for the present and future generations examples of physical surroundings in which past generations lived. The public health, safety and welfare of the community require the prevention of needless destruction and impairment, and promotion of the economic utilization of such structures, site and areas.

City of San Jose. The City of San Jose 2020 General Plan (City of San Jose 2004) includes the following relevant cultural resources goals and policies (because only relevant policies are included here, numbering is non-sequential):

Historic, Archaeological and Cultural Resources Goal:

Preservation of historically and archaeologically significant structures, sites, districts and artifacts in order to promote a greater sense of historic awareness and community identity and to enhance the quality of urban living.

Historic, Archaeological and Cultural Resources Policies:

- Policy 1: Because historically or archaeologically significant sites, structures and districts are irreplaceable resources, their preservation should be a key consideration in the development review process.
- Policy 4: Areas with a concentration of historically and/or architecturally significant sites or structures should be considered for preservation through the creation of Historic Preservation Districts.
- Policy 5: New development in proximity to designated historic landmark structures and sites should be designed to be compatible with the character of the designated historic resource. In particular, development proposals located within the Areas of Historic Sensitivity designation should be reviewed for such design sensitivity.
- Policy 7: Structures of historic, cultural or architectural merit which are proposed for demolition because of public improvement projects should be considered for relocation as a means of preservation. Relocation within the same neighborhood, to another compatible neighborhood or to the San José Historical Museum should be encouraged.
- Policy 8: For proposed development sites which have been identified as archaeologically sensitive, the City should require investigation during the planning process in order to determine whether valuable archaeological remains may be affected by the project and should also require that appropriate mitigation measures be incorporated into the project design.
- Policy 9: Recognizing that Native American burials may be encountered at unexpected locations, the City should impose a requirement on all development permits and tentative subdivision maps that upon discovery of such burials during construction, development activity will cease until professional archaeological examination and reburial in an appropriate manner is accomplished.
- Policy 10: Heritage trees should be maintained and protected in a healthy state. The heritage tree list, identifying trees of special significance to the community, should be periodically updated.

County of Santa Clara. The County of Santa Clara General Plan (County of Santa Clara 1994) includes the following relevant cultural resources strategies, policies, and implementation measures:

C-RC 49

Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values.

Strategy #2:

Prevent or Minimize Adverse Impacts on Heritage Resources

C-RC 52

Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources.

Strategy #3:

Restore, Enhance and Commemorate Resources

C-RC 54

Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource.

City of Sunnyvale. The City of Sunnyvale General Plan (City of Sunnyvale 1995) includes the following relevant cultural resources goals, policies, and implementation measures:

Heritage Preservation Sub-Element

Goal 6.3B	To enhance, preserve and protect Sunnyvale's heritage, including natural features, the built environment and significant artifacts.
Policy 6.3B.1	Preserve existing landmarks and cultural resources and their environmental settings.
Policy 6.3B.4	Identify and work to resolve conflicts between the preservation of heritage resources and alternative land uses.
Policy 6.3B.5	Seek out, catalog and evaluate heritage resources which may be significant.
Policy 6.3B.10	Archeological resources should be preserved whenever possible.

City of Mountain View. In the City of Mountain View 1992 General Plan (City of Mountain View 1992), the Environmental Management chapter includes the following relevant cultural resources strategies, policies, and implementation measures:

Goal J:	Identify and preserve the city's archaeological resources.
Policy 27.	Improve awareness of the city's archaeological resources.

Ravenswood Pond Complex

City of Menlo Park. The Open Space and Conservation Element of the Menlo Park General Plan (City of Menlo Park 1973) provides the following relevant cultural resources goal and policy. The City of Menlo Park General Plan Policy Document (City of Menlo Park 1994) does not include an update of this information associated with cultural resources.

Open Space and Conservation Goal #8: To preserve historic buildings, objects, and sites of historic and cultural significance.

Open Space and Conservation Policy #6: Protect conservation and scenic areas, historic and cultural sites from deterioration or destruction by vandalism, private actions or public actions.

County of San Mateo. The County of San Mateo General Plan (County of San Mateo 1986) is largely focused on the identification, preservation, and rehabilitation of historic structures, but includes the following general cultural resources strategies, policies, and implementation measures:

5.10 Encourage cooperative educational programs by educational and historic groups.

5.11 a. Identify high priority resources in the comprehensive inventory and apply for their designation as State Point of Historic Interest, State Historical Landmark, or inclusion in the National Register of Historic Places. b. Establish historic districts for areas which include concentrations of historic resources found in the comprehensive inventory.

5.12 Encourage the rehabilitation and recycling of historic structures.

5.14 Recommend State and/or national register status for significant archaeological/paleontological sites.

3.7.3 Environmental Impacts and Mitigation Measures

Overview

This section describes environmental impacts and mitigation measures related to cultural resources. It includes a discussion of the criteria used to determine the significance of impacts. This discussion includes consideration of resources under NHPA and CEQA, but without offering the confusion of using two sets of similar terminology. The impacts and mitigation measures below are generally discussed using CEQA language such as “significant impacts” rather than “adverse effects.” Potential impacts are characterized by evaluating direct, indirect, short-term (temporary), and long-term effects. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.7.1, Physical Setting, and not the proposed conditions that would occur under the No Action Alternative.[2] This approach is consistent with CEQA, which requires that project impacts be evaluated against existing conditions. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) management documents and practices.

As a reminder, cultural resources may be historic or prehistoric. The word “historic” may be a temporal reference, or it may signify the importance of a resource from either the historic or prehistoric era. A “historical resource,” as defined by CEQA, is a site that is eligible or potentially eligible for listing on the CRHR. For example, a resource that dates to the historic-era does not inherently mean that it has the significance to qualify as a historical resource (CEQA) or historic property (NHPA). The reader must follow the context of the discussion to understand which use of the word is being made.

[2] “No Action Alternative” is the NEPA term. It corresponds to the CEQA term “No Project Alternative.” This Final EIS/R uses No Action throughout.

Significance Criteria

NHPA

Under NHPA, if it is determined that historic properties may be affected by an undertaking, the agency proceeds with the Section 106 process, assessing adverse effects (called significant impacts under CEQA). The definition of adverse effects is found in Section 800.5(a)(1) of the regulations of NHPA. The definition of adverse effects states:

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with The Secretary of Interior’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property’s use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

This significance criterion is discussed below in Phase 2 Impact 3.7-2, which addressees the potential disturbance of the historic salt ponds and associated structures, which may be considered a significant cultural landscape within the Phase 2 project.

CEQA

According to the CEQA Guidelines, an impact to a cultural resource is considered significant if implementation of the proposed project or alternatives under consideration would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

The CEQA Guidelines (California Code of Regulations Section 15064.5) define “substantial adverse change” as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings. The significance criteria listed above are included in Impact 3.7-1, which addresses the potential disturbance of known or unknown cultural resources located within the Phase 2 project ponds, and in Impact 3.7-2, which addresees the potential disturbance of the historic salt ponds and associated structures that may be considered a significant cultural landscape within the Phase 2 project ponds.

As explained in Section 3.1.2, although both the CEQ Regulations for Implementing NEPA (CEQ 2015b) and the CEQA Guidelines (AEP 2014) were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology.

Program-Level Evaluation Summary

Three programmatic-level alternatives were considered and evaluated in the 2007 EIS/R: the No Action Alternative (Programmatic Alternative A); the Managed Pond Emphasis (Programmatic Alternative B); and the Tidal Marsh Emphasis (Programmatic Alternative C). Programmatic Alternative C was selected and is the alternative implemented under the Phase 1 restoration actions completed to date. Therefore, a summary of the impacts for Programmatic Alternative C from the 2007 EIS/R is provided below.

Under Programmatic Alternative C, the 2007 EIS/R concluded that impacts to unanticipated cultural resources would be less than significant with implementation of Mitigation Measure 3.8-1 (discussed in Chapter 2, Alternatives) and that impacts to the historic salt ponds cultural landscape would be less than significant with implementation of Mitigation Measure 3.8-2 (discussed in Chapter 2).

As discussed above, since completion of the 2007 EIS/R, implementation of Mitigation Measure 3.8-2 has consisted of surveys and determinations of eligibility for the Alviso Salt Works Historic Landscape and the Eden Landing Salt Works Historic Landscape, and the Ravenswood salt works was determined to not constitute a historic resource. Mitigation for impacts to the Alviso and Eden Landing landscapes was codified in the *Memorandum of Agreement between the U.S. Fish & Wildlife Service and the California State Historic Preservation Officer, Regarding the South Bay Salt Pond Restoration Project, Including Restoration of Former Industrial Salt Ponds to Tidal Salt Marsh and Other Wetland Habitats, Including the Former Salt Works Sites within the Alviso Unit on the Don Edwards San Francisco Bay National Wildlife Refuge and California Department of Fish and Game's Eden Landing Ecological Reserve; Alameda and Santa Clara Counties, California* (MOA) (USFWS 2012). Execution of the MOA constitutes completion of the Section 106 process. All stipulations of the MOA, including survey and recordation, have been completed, except for stipulation IIB—which consists of public interpretation that would be included as part of Phase 2—and ongoing monitoring stipulations that will occur during each phase of the SBSP Restoration Project.

Although impact evaluation to paleontological resources was not directly addressed in the 2007 EIS/R, such an analysis was not considered necessary due to the nature of sediments within the project's vertical APE and the lack of potential for impacts. As described above in "Geomorphic Setting," the project area is underlain by late Holocene bay mud. Project impacts would be focused on the built-up levees themselves, with some minimal excavation into underlying sediments (channels, etc.). Impacts would be confined to historic-era fill or the underlying bay mud, with no potential for harboring unique paleontological resources. As such, there is no need for additional consideration of paleontological impacts.

Project-Level Evaluation

Phase 2 Impact 3.7-1: Potential disturbance of known or unknown cultural resources.

The scale and scope of the SBSP Restoration Project area necessarily means that there is a wide range of known and unknown cultural resources that may be disturbed by some aspect of individual restoration activities. Because so many of these resources are probably obscured, they may only be encountered during project-related earthmoving activities. Accidental discoveries made during construction may be unavoidable; however, as emphasized in the NHPA, CEQA, and local plans and policies, wherever practicable, preservation of cultural resources is preferred over additional damage and/or data recovery.

Alviso-Island Ponds

Alternative Island A (No Action). Only limited operation and maintenance (O&M) activities would occur under Alternative Island A (the No Action Alternative). The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, so Alternative A would not adversely affect historical resources.

Alternative Island A Level of Significance: No Impact

Alternative Island B. CA-ALA-338, a previously recorded site assumed to be the remnant of a Nelson (1909) shellmound, was mapped in 1980 as being in the northwest corner of Pond A19, near a proposed breach location. However, as described above in "Project Setting" for the Alviso-Island Ponds, the location was revisited during surveys for this project, and it appears that the site was erroneously recorded in 1980. The shellmound mapped by Nelson was several thousand feet east of Pond A19 and outside of the Phase 2 APE. No evidence for the site was encountered during project surveys.

The historic-era town of Drawbridge (P-01-003291) is located on Station Island between Pond A21 and A20. No direct or indirect effects would occur to Station Island, the levees surrounding it, or the bridges at either end of Drawbridge as a result of Alternative Island B. Increased sedimentation and connectivity between Pond A20 and A19 would not cause substantial adverse change to the historic-era resources of Drawbridge.

No potential disturbance to known cultural resources would occur as a result of the Alternative Island B. However, there is the potential that previously undocumented cultural resources are present below the surface, including buried resources related to Drawbridge or CA-ALA-338, which were not evident during survey. Since **SBSP Mitigation Measure 3.8-1** (described in Chapter 2 of this document) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. As discussed above for Alternative Island B, no potential disturbance to known cultural resources would occur as a result of Alternative Island C. However, there is the potential that previously undocumented cultural resources are present below the surface, including buried resources related to Drawbridge or CA-ALA-338, which were not evident during survey Since **SBSP Mitigation Measure 3.8-1** (described in Chapter 2 of this document) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Only limited O&M activities would occur under Alternative Mountain View A (the No Action Alternative). The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect historical resources.

Alternative Mountain View A Level of Significance: No Impact

***Alternative Mountain View B*.** Aside from the ponds themselves, which are part of the Alviso Salt Works Historic Landscape (discussed below under SBSP Phase 2 Impact 3.7-2), no cultural resources have been identified through background research or primary field surveys within the Mountain View pond cluster. As such, no potential disturbance to known cultural resources would occur as a result of Alternative Mountain View B. However, there is the potential that previously undocumented cultural resources are present below the surface, that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. As discussed for Alternative Mountain View B, no potential disturbance to known cultural resources would occur as a result of Alternative Mountain View C. However, there is the potential that previously undocumented cultural resources are present below the surface, that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative: Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Only limited O&M activities would occur under Alternative A8 A (the No Action Alternative). USFWS would continue to operate and maintain the ponds in accordance with the

AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect historical resources.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. CA-SCL-810H, a previously recorded site assumed to be the remnant of a small World War II shipbuilding operation is on the eastern edge of Pond A8, along Alviso Slough. Most of the building materials appear to have been salvaged after the facility closed. Concrete crane footings and floors, piers, and a portion of a boat ramp still remain. Large amounts of modern concrete rubble cover the remaining portions of the site. As discussed in the Phase 1 project-level evaluation in the 2007 EIS/R, CA-SCL-810H has been highly disturbed by the salvage of scrap metal after the yard closed and the deposition of urban concrete rubble in the latter half of the twentieth century. The site has lost the integrity that would make it eligible for listing to the NRHP or CRHR. Also, no Phase 2 activities are planned in the immediate vicinity of the site. As a result, impacts to CA-SCL-810H resulting from implementation of the Phase 2 actions would be less than significant.

No potential disturbance to known cultural resources would occur as a result of Alternative A8 B. However, there is the potential that previously undocumented cultural resources are present below the surface, including buried resources related to a warehouse identified on an 1873 map of the area (Figure 3.7-4), that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Only limited O&M activities would occur under Alternative Ravenswood A (the No Action Alternative). The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. The outboard levees along Ponds R3 and R4 provide protection from tidal flows and would continue to be maintained as a component of the United States Army Corps of Engineers (USACE) 1995 O&M permit. No new activities would occur under Phase 2, and Alternative A would not adversely affect historical resources.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. No previously identified cultural resources are present within the Phase 2 Ravenswood APE. The Ravenswood pond complex was evaluated as a cultural landscape and determined by the SHPO to be not eligible for the NRHP and appears to lack sufficient integrity for CRHR eligibility as well. During pedestrian survey for the Phase 2 project, two built environment resources—a circa1950s pump house at the western end of Pond S5 and a large control gate and diversion structure at the head of the AAC, which served as the primary water control structure for this pond cluster—were identified and recorded. Neither of these structures represents a unique or distinctive type of construction and would only be considered significant as contributing elements of a historic district or cultural landscape. Given that the Ravenswood Salt Works was determined to be ineligible as a historic property, these two structures are not considered significant. Furthermore, the proposed project activities would not directly impact these structures.

No potential disturbance to known cultural resources would occur as a result of Alternative Ravenswood B. However, there is the potential that previously undocumented cultural resources are present below the surface that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. As discussed for Alternative Ravenswood B, no potential disturbance to known cultural resources would occur as a result of Alternative Ravenswood C. However, there is the potential that previously undocumented cultural resources are present below the surface that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. As discussed for Alternative Ravenswood B, no potential disturbance to known cultural resources would occur as a result of Alternative Ravenswood D. However, there is the potential that previously undocumented cultural resources are present below the surface that were not evident during the survey. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.7-2: Potential disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.

Alviso-Island Ponds

Alternative Island A (No Action). Only limited O&M activities would occur under Alternative Island A (the No Action Alternative). USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect the historic landscape.

Alternative Island A Level of Significance: No Impact

Alternative Island B. As discussed in "Project Setting" and Previously Recorded Cultural Resources, the Alviso-Island Ponds are a contributing element of the Alviso Salt Works Historic Landscape, which has been determined by the SHPO to be a historic property and, therefore, is considered a historical resource under CEQA as well. The proposed Phase 2 project activities would cause substantial adverse change to the ponds and other landscape features that are contributing elements of the historic landscape. These impacts were previously identified in the 2007 EIS/R. Because **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would be implemented as part of the Phase 2 project, project-related impacts to recorded or unrecorded cultural resources would be less than significant. The primary element of this mitigation measure is the determination of eligibility of the cultural landscapes and completion of HALS recordation for those pond complexes considered to be historic landscapes. The

HALS mitigation for the SBSP Restoration Project was codified in the MOA (USFWS 2012). The HALS recordation has since been completed by USFWS for the Alviso Salt Works (HALS CA-92), accepted by the NPS, and submitted to the SHPO and Library of Congress for curation. Given the execution of the MOA and associated treatment plan and mitigation measures, Phase 2 impacts have already been reduced to a less-than-significant level.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. As discussed above for Alternative Island B, the Alviso unit has been determined to be a historic property by the SHPO and Phase 2 impacts to the historic landscape have been previously mitigated through execution of the MOA and associated treatment plan and mitigation measures, including HALS documentation. As such, Phase 2 impacts have already been reduced to a less-than-significant level.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Only limited O&M activities would occur under Alternative Mountain View A (the No Action Alternative). USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect the historic landscape.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. The Mountain View Ponds are a contributing element of the Alviso Salt Works Historic Landscape. As described above for the Alviso-Island Ponds, the Alviso unit has been determined to be a historic property by the SHPO and Phase 2 impacts to the historic landscape have been previously mitigated through execution of the MOA and associated treatment plan and mitigation measures, including HALS documentation. As such, Phase 2 impacts have already been reduced to a less-than-significant level.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. As described for Alternative Mountain View B, the Alviso unit has been determined to be a historic property by the SHPO, and Phase 2 impacts to the historic landscape have been previously mitigated through execution of the MOA and associated treatment plan and mitigation measures, including HALS documentation. As such, Phase 2 impacts have already been reduced to a less-than-significant level.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Only limited O&M activities would occur under Alternative A8 A (the No Action Alternative). USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect the historic landscape.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. The Alviso-A8 Ponds are a contributing element of the Alviso Salt Works Historic Landscape. As described above for the Alviso-Island Ponds, the Alviso unit has been determined to be a historic property by the SHPO, and Phase 2 impacts to the historic landscape have been previously mitigated through execution of the MOA and associated treatment plan and mitigation measures, including HALS documentation. As such, Phase 2 impacts have already been reduced to a less-than-significant level.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Only limited O&M activities would occur under Alternative Ravenswood A (the No Action Alternative). USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of the Phase 1 actions. No new activities would occur under Phase 2, and Alternative A would not adversely affect the historic landscape.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. As discussed in the "Project Setting," the Ravenswood pond complex has been determined by the SHPO to not constitute a historic landscape and is not eligible as a historic property under any criteria; also, the Ravenswood pond complex does not appear to be eligible for the CRHR. As such, the Ravenswood Phase 2 impacts would not adversely affect a significant cultural landscape.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. As discussed in Alternative Ravenswood B, the Ravenswood pond complex has been determined by the SHPO to not constitute a historic landscape and is not eligible as a historic property under any criteria; also, the Ravenswood pond complex does not appear to be eligible for the CRHR. As such, the Ravenswood Phase 2 impacts would not adversely affect a significant cultural landscape.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. As discussed in Alternative Ravenswood B, the Ravenswood pond complex has been determined by the SHPO to not constitute a historic landscape and is not eligible as a historic property under any criteria; also, the Ravenswood pond complex does not appear to be eligible for the CRHR. As such, the Ravenswood Phase 2 impacts would not adversely affect a significant cultural landscape.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

The Phase 2 impacts to cultural resources and the levels of significance are summarized in Table 3.7-3. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the AMP and other Refuge management documents and practices. The cultural resources analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.7-3 Phase 2 Summary of Impacts – Cultural Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.7-1: Potential disturbance of known or unknown cultural resources.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.7-2: Potential disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.8 Land Use and Planning

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing land uses and policies within the Phase 2 project area and whether implementation of the project would cause a substantial adverse effect on land use resources from project implementation. The information presented is based on a review of federal, state, regional, county and city plans, and other pertinent regulations, presented in the regulatory framework setting section. Using this information as context, an analysis of land use related environmental impacts of the project is presented for each alternative. The analysis of land use impacts of the project is presented for each alternative. The program-level mitigation measures described in Chapter 2 would be implemented as part of this project. Therefore, this section only includes additional mitigation measures as needed.

3.8.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). Applicable regional and local plans and policies were reviewed for information on existing land uses and relevant policies. A number of city and county general plans and other planning documents identify land use goals and existing land use designations in the Phase 2 project area. The policy discussion is organized according to the jurisdictions that provide regulatory oversight to lands adjacent to or nearby the Phase 2 project areas.

Regional Setting

The greater South Bay, including the project vicinity of the SBSP Restoration Project, Phase 2, consists of urban areas (residential, commercial, and industrial uses), tidal mudflats, salt flats, salt marsh, salt evaporative ponds, creeks, flood control, and rural land and wildlife interpretative areas. The Alviso Pond Complex is located in Alameda and Santa Clara counties, and the Ravenswood Pond Complex is located in San Mateo County. At the Phase 2 project scale, although the ponds are all owned by the federal government, the pond clusters fall within the boundaries of several different cities and counties. Table 3.8-1 provides a listing of the cities and counties adjacent to each pond cluster.

Table 3.8-1 Phase 2 Project Area Jurisdictions

POND COMPLEX	POND CLUSTER	JURISDICTION	
		CITY	COUNTY
Alviso	Island Ponds	Fremont	Alameda
	Mountain View Ponds	Mountain View	Santa Clara
	A8 Ponds	San Jose	Santa Clara
Ravenswood	Ravenswood Ponds	Menlo Park	San Mateo
		Redwood City	San Mateo

Other nearby municipalities include Milpitas, Santa Clara, Sunnyvale, Palo Alto, and East Palo Alto (see Figure 3.8-1). The Phase 2 pond clusters are generally surrounded by or bordered by parks or other urban land uses in those portions of municipalities that are adjacent to them. The exception is the Island Ponds, which do not directly border any urban land uses.

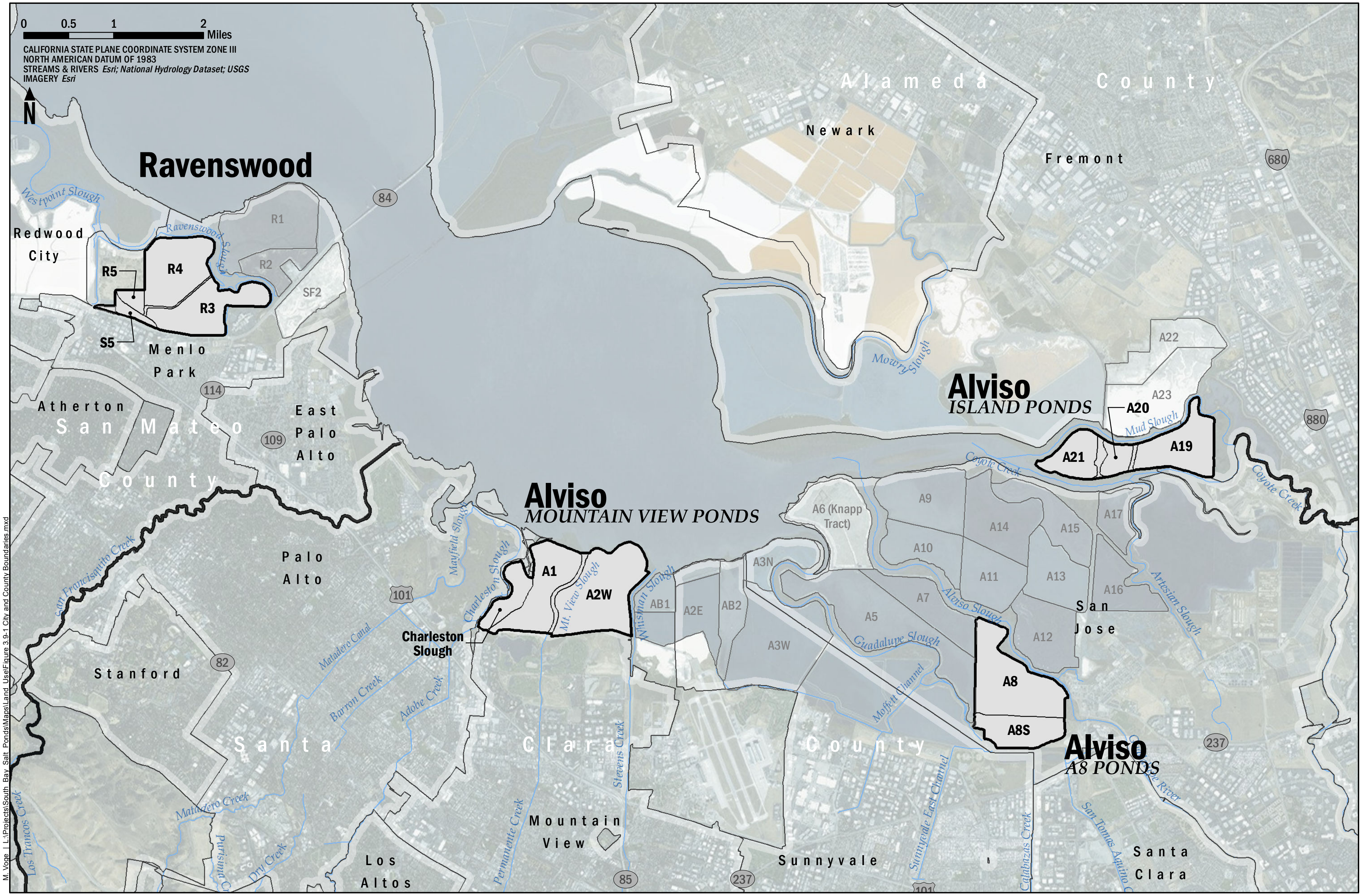
Project Setting

Phase 2 of the SBSP Restoration Project consists of approximately 2,385 acres of former salt ponds in the Alviso and Ravenswood pond complexes. The Phase 2 ponds were acquired in 2003 by the USFWS and CDFW as part of a 15,100 acre transaction with Cargill. The Phase 2 ponds considered in this Final EIS/R are largely within the USFWS-owned and -managed portions of the larger SBSP Restoration Project. The Phase 2 project area is located within several different cities and counties. However, almost all of the Phase 2 project area is part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) and is therefore under federal jurisdiction and not generally subject to county or city land use jurisdiction. There are several areas that are not within the Refuge and are therefore subject to local (city, county, or special district) regulations, policies, and plans. Those areas are as follows:

- Charleston Slough and its southern boundary the Coast Casey Forebay levee, which are part of the City of Mountain View and are included in Alternative Mountain View C;
- The western levee of Charleston Slough, which is owned by the City of Palo Alto but maintained by Santa Clara Valley Water District (SCVWD) and is included in Alternative Mountain View C;
- Shoreline Park in City of Mountain View, which will be used for construction access and staging and which will have additional trail and other public access feature connections in all Mountain View action alternatives;
- Bedwell Bayfront Park in City of Menlo Park, which would be used for construction staging and access in all Ravenswood action alternatives, and through which the City of Redwood City's Bayfront Canal and Atherton Channel Project would be constructed in Alternative Ravenswood D.

Existing land uses within the Phase 2 project area include tidal mudflats, salt flats, salt marsh, salt evaporative ponds, creeks, sloughs, flood control basins, and wildlife interpretative areas. There is also a section of elevated railroad tracks and utility corridors for PG&E towers. Designated land uses surrounding the Phase 2 ponds include residential, commercial, and industrial uses as shown in Figure 3.8-2, as well as local roads, a state highway, rail corridors, flood control basins, other restoration areas, and recreational or other public facilities.

One land use nearby the Phase 2 project area that is worth a particular note is airports. There are two commercial airports in the South Bay (San Francisco International Airport and Norman Y. Mineta San Jose International Airport), smaller private airstrips in San Carlos and Hayward, and the Moffett Federal Airfield, which is also used by the California Air National Guard. These airfields do present some potential for bird strikes by planes flying into or out of them. Such bird strikes are rare enough as to present very little potential for affecting the various populations of special-status birds.



LEGEND

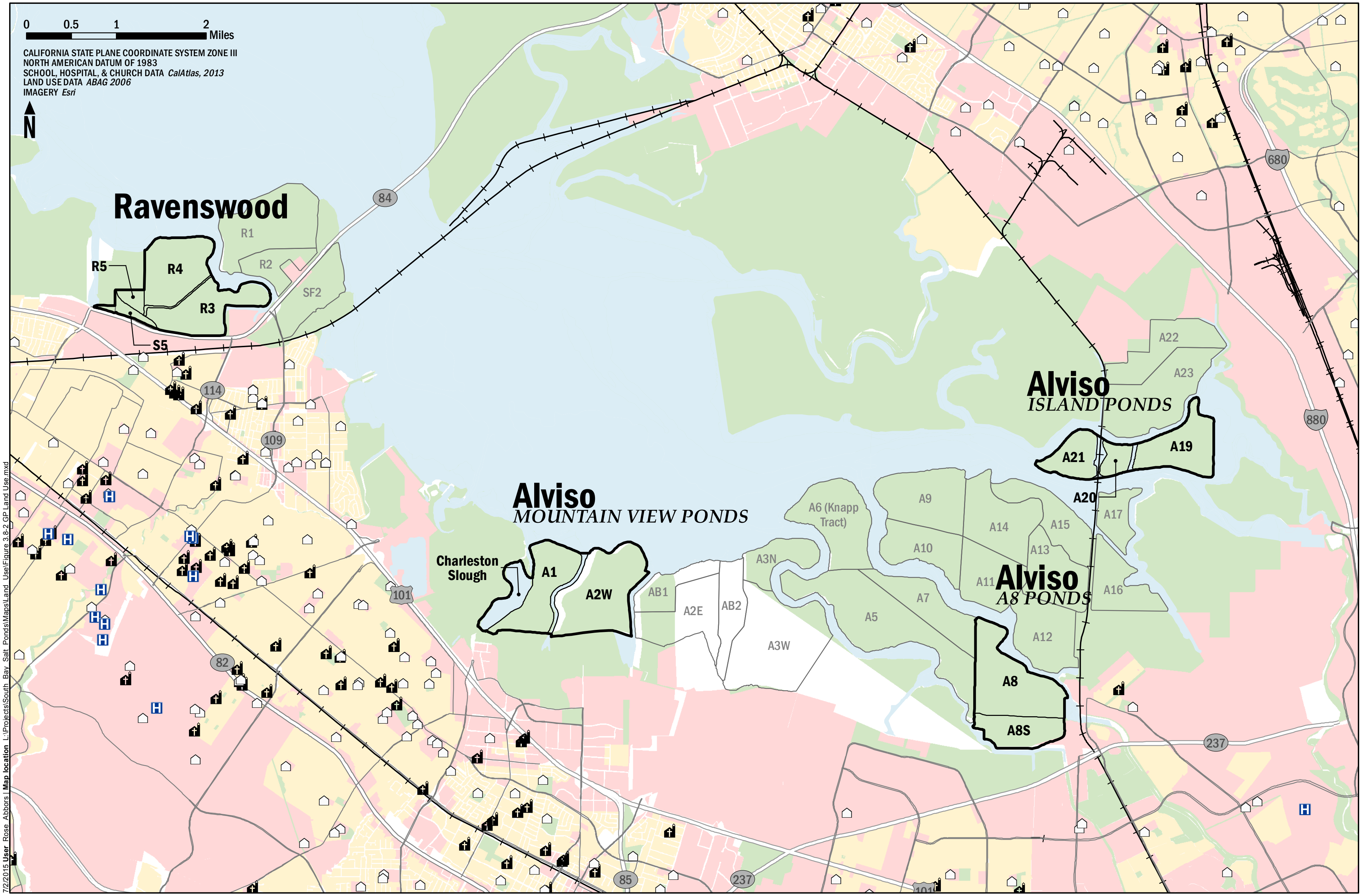
Phase 2 Project Area

URS

South Bay Salt Pond Restoration Project

Figure 3.8-1

City and County Boundaries



LEGEND

Phase 2 Project Area

General Plan Land Use Designation

Commercial/ Industrial

Open Space

Residential

Railroad

Church

Hospital

School

URS
South Bay Salt Pond Restoration Project

Figure 3.8-2
General Plan Land Uses

The potential impact of concern is more about the possibility of reductions in aviation safety from aircraft hitting birds in the air. An analysis of these impacts was conducted for the Bair Island EIS/R (USFWS 2006), which identified the greatest risks to aviation safety from bird strikes as being from larger and higher-flying waterfowl that are attracted more to open-water ponds than they are to tidal marshes. Tidal marsh tends to attract smaller and lower-flying or ground-based shorebirds. This point was mirrored in the Federal Aviation Administration's 2007 Circular on hazardous wildlife attractants on or near airports, which found that cormorants, cranes, pelicans, and ducks presented much greater hazards to aviation than do small shorebirds (FAA 2007).

With the exception of the Mountain View Ponds, the ponds included in the Phase 2 alternatives are all further away than the recommended 10,000-foot distance a project should be from an airport. The southeast corner of the Mountain View Ponds is approximately 2,500 feet from the end of the Moffett Federal Airfield runway. However, since, under Phase 2 actions, the Mountain View Ponds would be converted from open water ponds to tidal marshes, the Phase 2 actions are not expected to increase the risk or hazard associated with bird strikes. For this reason, bird strikes are not exhaustively assessed in this Final EIS/R.

Alviso-Island Ponds

The Alviso-Island pond cluster (A19, A20, and A21) is surrounded by Coyote Creek to the south, Mud Slough to the north, their confluence, and San Francisco Bay to the west. The Ponds A22 and A23 and the Warm Springs restoration area (all part of the Refuge) and the City of Fremont are to the east. The southern levees of these ponds were breached in 2006 as part of the Initial Stewardship Plan (ISP) to begin their restoration to tidal marsh. They currently provide habitat to many species of fish and birds (see Section 3.5 for complete description of species that occupy specific habitat within the Phase 2 project area). The City of Fremont General Plan categorizes the Island Ponds as Open Space-Resource Conservation/Public (City of Fremont 2011). They are closed to the public and are not used for recreation, which occurs elsewhere within the Alviso pond complex. The exception to this is hunting which is allowed during open season, by boat only. The nearest recreational trails are along the exterior levees of Ponds A15, A16, and A17.

Alviso-Mountain View Ponds

The Alviso-Mountain View pond cluster (A1, A2W, and Charleston Slough) is the westernmost pond cluster of the Alviso Pond Complex. Ponds A1 and A2W are north of Mountain View and east of the City of Palo Alto, and the Palo Alto flood control basin immediately adjacent to Charleston Slough. Charleston Slough is located between A1 to the east and the Palo Alto Flood Control Basin to the west. Parkland and public recreation, primarily at Mountain View's Shoreline Park and the park's sailing lake, are the primary land uses in the vicinity of the Mountain View pond cluster. Nearby land uses include light industrial and residential in the City of Mountain View. Charleston Slough, Permanente Creek, Mountain View Slough, and Stevens Creek border this cluster. Stevens Creek and Permanente Creek carry discharge to San Francisco Bay. The Stevens Creek Mitigation Marsh and the Mountain View Mitigation Marsh border portions of the southern end of pond A2W. Other portions of the Alviso Pond Complex lay to the east of this cluster. In Alternative C, Charleston Slough would be incorporated into the project designs (as described fully in Chapter 2, Alternatives), which would make it and the levees surrounding it part of the project footprint for that alternative. This necessitates the inclusion of the cities of Mountain View and Palo Alto as well as the SCVWD into the analysis of land use-related regulatory analysis.

The Santa Clara County General Plan categorizes Ponds A1 and A2W as Resource Conservation Area-Other Public Lands, and their interiors and eastern, western, and northern borders are closed to the public. Their southern borders abut the closed landfill that now forms Shoreline Park, and there are recreational trails and bicycle paths along them. PG&E maintains an easement along Pond A2W's levees to allow it to access and maintain two separate power lines and their towers that pass through the pond. Stevens Creek and Permanente Creek/Mountain View Slough, outflows for rainfall and other runoff, flow to the bay in the project area.

City of Mountain View's Charleston Slough serves numerous important land use purposes regulated by multiple agencies and interests. The Bay Conservation and Development Commission (BCDC) requires the City of Mountain View to restore 53 acres of the slough to tidal marsh habitat (URS 2012). Charleston Slough also serves as the intake for the Shoreline Park Sailing Lake. Its western levee is part of the Santa Clara County Water District flood protection system. It provides habitat to special status species and, although it is not part of the Refuge, actions related to Charleston Slough are of interest to the USFWS. The slough was identified in the Programmatic EIS/R as an area for possible future acquisition and incorporation into the Refuge; it was within the Authorized Expansion Boundary. Because of its easy accessibility and heavy use by foraging birds, Charleston Slough is regarded as one of the premier bird watching locations in the San Francisco Bay Area, and birding interests have been involved in the discussion over long-term management solutions for Charleston Slough.

Alviso-A8 Ponds

Alviso Ponds A8 and A8S are located in the south central portion of the Alviso Pond Complex. This cluster is surrounded by Alviso Slough to the northeast, the City of Sunnyvale, a closed and capped landfill now in use as a business park, Baylands Park, and the Bay Trail to the south; Guadalupe Slough to the west; and the Alviso neighborhood of City of San Jose to the east. The Santa Clara County General Plan categorizes these ponds as Resource Conservation Area-Other Public Lands. Currently, this pond cluster provides flood storage during rain events. During Phase 1 of the restoration project, this cluster was made reversibly tidal through levee breaches and installation of tide gates in July of 2010. The objectives for this cluster include providing tidal habitat, and maintaining or improving flood protection.

Ravenswood Ponds

The Ravenswood Pond Complex consists of seven ponds along both sides of SR 84 west of the Dumbarton Bridge. The Phase 2 project actions include ponds R3, R4, R5, and S5. The Ravenswood Ponds in Phase 2 are bordered by the San Francisco Bay, Greco Island, and Westpoint Slough to the north, Bayfront Expressway (SR 84), UPRR right-of-way, and Menlo Park to the south, Ravenswood Slough to the east, and Bedwell Bayfront Park to the west. The City of Menlo Park General Plan designates these ponds as Non-Urban within the Flood Plain (FP) zoning district. Existing land uses in the vicinity of the Phase 2 Ravenswood ponds include parks (Bedwell Bayfront Park), tidal marsh (Greco Island), waterways (Flood Slough, which is owned by California State Lands and zoned FP by the City of Menlo Park), roads and rail corridors, utility lines and a PG&E substation, Cargill's industrial salt works, commercial/light industrial (the Facebook campus), the rest of the Ravenswood Pond Complex and other restoration areas, and residential areas of East Palo Alto, Menlo Park, and Redwood City.

3.8.2 Regulatory Setting

Under Sections 65300–65403 of the California Government Code, all cities and counties in California are required to provide comprehensive long-range plans for lands within their jurisdictions which contain seven mandatory elements: land use, housing, conservation, open space, circulation, noise, and safety. The Phase 2 actions of the SBSP Restoration Project are proposed within Alameda, San Mateo and Santa Clara counties. The Alameda, Santa Clara, and San Mateo County General Plans, and the Fremont, San Jose, Mountain View, and Menlo Park General Plans identify land use goals and existing land use designations in the SBSP Restoration Project's Phase 2 areas.

In addition, a number of regional plans have been developed by San Francisco Bay Area agencies— some individually, some in collaboration with other agencies. These agencies acknowledge a variety of environmental interests in the Bay Area and in some cases include the South Bay salt ponds in their discussions, analyses, policies and/or objectives. The following regional plans were reviewed for this analysis:

- Basin Plan – San Francisco Bay RWQCB;
- Baylands Ecosystem Habitat Goals Report – San Francisco Bay Area Wetlands Ecosystem Goals Project;
- Bay Plan – BCDC;
- CALFED ROD and EIR/S – CALFED Bay Delta Authority;
- CALFED ERP; Draft Stage 1 Implementation Plan – CALFED Bay Delta Authority;
- Comprehensive Conservation Plan (CCP) – Don Edwards San Francisco Bay National Wildlife Refuge (USFWS);
- Comprehensive Conservation and Management Plan – The San Francisco Estuary Project;
- Implementation Strategy – San Francisco Bay Joint Venture;
- Invasive Spartina Project: California State Coastal Conservancy/USFWS;
- Long Term Management Strategy for Dredge Material – U.S. Environmental Protection Agency;
- NASA Ames Draft Development Plan – NASA Ames Research Center;
- South Bay Salt Pond Restoration Feasibility Analysis – Stuart W. Siegel; Philip A.M. Bachand; and
- Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California – USFWS.

Only regional plans, county plans and city plans that refer specifically to Phase 2 of the SBSP Restoration Project are discussed in this section. Other relevant local and regional plans and regulations are discussed in other sections of Chapter 3 in this EIS/R.

Regional Plans

Regional plans discussed below contain objectives typically developed by a variety of stakeholders regarding environmental issues that transcend the geographic and jurisdictional boundaries which exist under the city and county framework. Regional plans address land uses when they discuss the intensity of development throughout the region. Some regional plans advocate for developing specific areas and conserving other areas, while other plans discuss the impacts of potential future development and other activities on existing natural habitats and resources.

Basin Plan – San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB was founded in 1950 with the purpose of protecting the quality of surface water and groundwater within the San Francisco Bay region for beneficial uses. The State Water Quality Control Board required that the RWQCB develop a Water Quality Control Plan (Basin Plan) for the San Francisco Basin, and the first comprehensive Basin Plan was adopted in 1975. The most recent amendment was adopted in 2013.

The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay region. The Basin Plan must include a statement of beneficial water uses that the RWQCB will protect, the water quality objectives needed to protect the designated beneficial water uses, and the implementation plans for achieving the water quality objectives through its regulatory programs (2007 EIS/R).

The Basin Plan makes reference to salt marsh ecosystems, specifically within the context of wetland restoration using dredged material. However, no direct reference to the South Bay salt ponds, particularly with regard to land use plans or decisions, is made.

San Francisco Bay Plan – San Francisco Bay Conservation and Development Commission

BCDC's jurisdiction, as well as its regulations and plans are described in Section 3.6 (Biological Resources), 3.7 (Recreational Resources), and 3.17 (Visual Resources) of this Final EIS/R. This section provides additional information as it relates to land use. The McAteer-Petris Act (Cal. Govt. Code Sections 66600–66694) is the California state law that established the San Francisco BCDC as a state agency; prescribes BCDC's powers, responsibilities and structure; and describes the broad policies the Commission must use to determine whether permits can be issued for activities in and along the shoreline of San Francisco Bay.

Section 66605 addresses the benefits, purposes, and manner of filling within BCDC's jurisdictions, and states the following:

(a) That further filling of San Francisco Bay and certain waterways specified in subdivision (e) of Section 66610 should be authorized only when public benefits from fill clearly exceed public detriment from the loss of the water areas and should be limited to water-oriented uses (such as ports, water-related industry, airports, bridges, wildlife refuges, water-oriented recreation, and public assembly, water intake and discharge lines for desalinization plants and power generating plants requiring large amounts of water for cooling purposes) or minor fill for improving shoreline appearance or public access to the bay;

(b) That fill in the bay and certain waterways specified in subdivision (e) of Section 66610 for any purpose should be authorized only when no alternative upland location is available for such purpose;

(c) That the water area authorized to be filled should be the minimum necessary to achieve the purpose of the fill;

(d) That the nature, location, and extent of any fill should be such that it will minimize harmful effects to the Bay Area, such as, the reduction or impairment of the volume surface area or circulation of water, water quality, fertility of marshes or fish or wildlife resources, or other conditions impacting the environment, as defined in Section 21060.5 of the Public Resources Code;

(e) That public health, safety, and welfare require that fill be constructed in accordance with sound safety standards which will afford reasonable protection to persons and property against the hazards of unstable geologic or soil conditions or of flood or storm waters;

(f) That fill should be authorized when the filling would, to the maximum extent feasible, establish a permanent shoreline;

(g) That fill should be authorized when the applicant has such valid title to the properties in question that he or she may fill them in the manner and for the uses to be approved.

Section 66605.1 addresses the desirability of development and preservation of shoreline by public and private development.

> The Legislature finds that in order to make San Francisco Bay more accessible for the use and enjoyment of people, the Bay shoreline should be improved, developed and preserved. The Legislature further recognizes that private investment in shoreline development should be vigorously encouraged and may be one of the principal means of achieving Bay shoreline development, minimizing the resort to taxpayer funds; therefore, the Legislature declares that the commission should encourage both public and private development of the Bay shoreline.

The Bay Plan was adopted by the BCDC in 1969 and has been amended subsequently. The goal of this Plan is twofold: “to protect the Bay as a great natural resource for the benefit of present and future generations” and to “develop the Bay and its shoreline to their highest potential with a minimum of Bay filling”. In 2011, the Bay Plan tidal marsh, tidal flat, fish and wildlife and subtidal findings and policies, the shoreline protection, appearance, design, and scenic views policies were amended and Climate Change Bay Plan was adopted and incorporated into the Bay Plan (BCDC 1969 [Amended 2011]).

The goals, policies, and recommendations of the Bay Plan that are relevant to the SBSP Restoration Project are as follows:

- If public funds are available, purchase and tidally restore salt ponds no longer needed for salt production. If public funds are not available, pursue other alternatives for protecting salt ponds:
- If areas are proposed for development, obtain an open space dedication. When development occurs, retain substantial amounts of open water, provide substantial public access, and develop the site in accordance with BCDC policies regarding non-priority shoreline uses.

- Promote saltwater aquaculture activities to retain area as open water.
- Build recreational developments, such as marinas and parks, in appropriate areas outboard of salt ponds or in sloughs, so long as the ability to produce salt and restore tidal action to salt ponds is not compromised.
- Pursue purchase of development rights on salt ponds (SBSP Restoration Project website 2007).

Plan Bay Area

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. On July 18, 2013, the Plan was jointly approved by the Association of Bay Area Governments (ABAG) Executive Board and by the Metropolitan Transportation Commission (MTC). The Plan includes the region’s Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades.

Plan Bay Area marks the nine-county region’s first long-range plan to meet the requirements of California’s landmark 2008 Senate Bill 375, which calls on each of the state’s 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. Working in collaboration with cities and counties, the Plan advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy. (ABAG and MTC 2013)

Implementation Strategy – San Francisco Bay Joint Venture

The San Francisco Bay Joint Venture (SFBJV) is a collaborative effort by 27 public agencies and private non-profit and corporate organizations to protect, restore, increase and enhance wetlands, riparian habitat and associated uplands throughout the San Francisco Bay region to benefit birds, fish and other wildlife. Its Implementation Strategy (Strategy) details the organization’s efforts to restore the San Francisco Estuary.

The Strategy categorizes all salt ponds as “Bay Habitats.” To that end, the Strategy suggests that SFBJV will work with Cargill to explore ways to enhance the habitat values of the Santa Clara County-based salt ponds for water-fowl and shorebirds (SFBJV 2001). It also makes reference to the Mid-Peninsula Regional Open Space District overseeing the tidal marsh restoration of a 200-acre salt pond. However, no specific land use plans or objectives are discussed in the Implementation Strategy.

Comprehensive Conservation Plan - Don Edwards San Francisco Bay National Wildlife Refuge

The Comprehensive Conservation Plan (CCP) specifies a management direction for the Refuge for the next 15 years. The goals, objectives, and strategies for improving Refuge conditions—including the types of habitat USFWS will provide, and management actions needed to achieve desired conditions are described in the CCP (USFWS 2012). However, the CCP explicitly excludes those portions of the Refuge that had been previously addressed in the SBSP Restoration Project and its associated program-level EIS/R and other planning and guidance documents. The CCP is included here for completeness and clarity.

Invasive Spartina Project: Conservancy / USFWS

The San Francisco Estuary Invasive Spartina Project is a regionally coordinated effort of federal, state, and local agencies and private landowners with the ultimate goal of arresting and reversing the spread of non-native cordgrasses in the San Francisco Estuary (California Coastal Conservancy and USFWS 2003). Since the peak of the invasive Spartina invasion in 2005, the Control Program has resulted in the elimination of more than 772 net acres (nearly 97%) of non-native cordgrasses from more than 20,000 acres of infested tidal marsh and 25,000 acres of mudflats bay-wide. The area of non-native Spartina has been reduced markedly since the first full season of effective treatment started in 2005. In most areas where non-native Spartina has been eradicated, the result has been rapid and large-scale return to a native plant species dominated habitat at low- and mid-marsh elevations, and a return to the natural mudflat and tidal channel conditions at lower elevations. As the marshes recover from the Spartina invasion over time, it is anticipated that native plant diversity will passively recover in most marshes.

In May 2014 the California Coastal Conservancy adopted an authorization of grant funds for the funding of revegetation and enhancement projects. The revegetation program goals are to: (1) Enhance and accelerate *Spartina foliosa* re-establishment at selected marshes through introduction of plugs or propagated seedlings that will support associated faunal communities including clapper rail foraging and nesting habitat; (2) Enhance and accelerate post-treatment marsh succession and complexity with introduction of other native marsh plant species (such as *Grindelia stricta*), which have a tall shrubby structure that will provide clapper rail nesting substrate, cover and high tide refugia; and (3) Provide additional high tide refugia by constructing high tide refuge islands (SCC 2014).

U.S. Environmental Protection Agency (USEPA) – Long Term Management Strategy for Dredge Material

The Long Term Management Strategy (LTMS) for Dredge Material is a cooperative effort of USEPA, the Corps, SWRCB, San Francisco Bay RWQCB, and BCDC to develop a new approach to dredging and dredged material disposal in the San Francisco Bay Area. An average of six million cubic yards of sediments must be dredged every year in order to maintain safe navigation in and around San Francisco Bay, resulting in controversy surrounding appropriate management of such an effort. The major goals of the LTMS are to: (1) "maintain in an economically and environmentally sound manner those channels necessary for navigation in San Francisco Bay and Estuary and eliminate unnecessary dredging activities in the Bay and Estuary;" (2) "conduct dredged material disposal in the most environmentally sound manner;" (3) "maximize the use of dredged material as a resource;" and (4) "establish a cooperative permitting framework for dredging and dredged material disposal applications" (US EPA 1998).

The Final Policy EIS/Programmatic EIR for the LTMS addresses the salt ponds in and around the South Bay mainly within the context of its role as habitat for a number of species, including the California least tern, snowy plover, California clapper rail, salt marsh harvest mouse and California brown pelican. While the presence of such species causes restrictions on potential management strategies, dredged material disposal has potential benefits, such as the creation or restoration of seasonal wildlife habitats by raising and modifying topography and thus improving wetland hydrology (US EPA 1998). Disposal of dredge material in the salt ponds would require a BCDC permit.

USFWS – Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California

The Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California features five endangered species: two endangered animals and three endangered plants. The biology of these species is at the core of the recovery plan, but the goal of this effort is the comprehensive restoration and management of tidal marsh ecosystems. The ultimate goal of this recovery plan is to recover all focal listed species so they can be delisted. The interim goal is to recover all endangered species to the point that they can be changed from endangered to threatened status. Within a 50-year planning period (based on estimated time to achieve sufficiently mature restored tidal marsh habitats), the Service expects that the following species recovery objectives will be met: (1) "Secure self-sustaining wild populations of each covered species throughout their full ecological, geographical, and genetic ranges;" (2) "Ameliorate or eliminate the threats, to the extent possible, that caused the species to be listed or of concern and any future threats;" and (3) "Restore and conserve a healthy ecosystem function supportive of tidal marsh species" (USFWS 2013).

County and City General Plans

County general plans contain goals, policies and implementation measures that provide planning guidance for the future. The Land Use Elements of the general plans contain goals concerning land use and are designed to serve as the basis for development decision-making for county lands.

City general plans act as "blueprints" for the long-term physical development of each city and contain goals, policies and implementation measures that provide planning guidance for the future. The Land Use Element of each general plan designates land uses within the respective city and presents land use goals and policies for future land use development decision-making for city lands.

Although the Phase 2 project area is located within to boundaries of several different cities and counties, the project area is primarily under federal jurisdiction and not subject to county or city land use jurisdiction. However, portions of the Phase 2 study area include these adjacent cities and counties, particularly City of Mountain View's Charleston Slough (included in Alternative Mountain View C) and Shoreline Park (used for access and staging) and City of Menlo Park's Bedwell Bayfront Park, used for access and staging and through which the Bayfront Canal and Atherton Channel Project would be constructed. Relevant goals and policies from applicable county and city general plans are presented below for each SBSP Restoration Project pond complex.

Alviso Pond Complex

Planning documents relevant to the Alviso Pond Complex include the Alameda County General Plan, Santa Clara County General Plan, City of Fremont General Plan, Alviso Master Plan, City of San Jose General Plan, and the City of Mountain View General Plan.

Alameda County General Plan. The Alviso Pond Complex is designated as Open Space in the Alameda County General Plan. The Alameda County General Plan, adopted in 1973, does not include a Land Use Element, and instead incorporates land use elements from each city General Plans and unincorporated area specific plans. However, policies applicable to the Salt Ponds are discussed in the May 4, 1995 Amended Open Space Element and are described as follows:

Shoreline and Bay Open Space - Principles for Shoreline and Bay Open Space

- Preserve Natural Ecological Habitats in Shoreline Areas: Outstanding natural ecological habitats in shoreline areas of the County should be designated for protection and maintenance as wildlife preserves as a means of protecting marine and wildlife and to permit ecological studies; and
- Provide For Orderly Transition of Phased Out Salt Extraction Areas to Uses Compatible With the Open Space Plan: Salt extraction areas, which will be operative through the plan period, should be designated as permanent open space. Areas that will not be active through the plan period should be phased out according to a planned program in such a manner as to maintain salt production cycles. Phased out areas should be converted to uses permitted within waterfront open spaces such as wildlife refuges or recreation areas. No filling of salt extraction areas should be permitted except for recreation purposes in selected areas as indicated on adopted local or regional plans (Alameda County 1995).

Santa Clara County General Plan. The Alviso Pond Complex is designated as Open Space in the Santa Clara County General Plan. The Santa Clara County General Plan 1995–2010 was adopted on December 20, 1994. Goals, objectives and policies pertinent to land use and the Salt Ponds are first articulated in the Resource Conservation section and its Mineral Resources subsection before being presented more succinctly in the Land Use Section (County of Santa Clara 1994).

In the Introduction to the Resource Conservation section, the third overall strategy, “Restore Resources Where Possible,” reads in part as follows:

> Where appropriate, degraded environments should be restored to the maximum extent possible, whether the subject is wetlands, quarries or landfills. These efforts should also be augmented by measures to restore “nature” and livability to our urban environments (p.H3).
>
> The following policies are among those that are dictated by the Plan’s Overall Strategies for resource conservation (p. H4):
>
> Policy C-RC 1: Natural and heritage resources shall be protected and conserved for their ecological, functional, economic, aesthetic, and recreational values.
>
> 1. Open lands not suitable or intended for urbanization should not be included in cities’ long term urban growth plans. Protections necessary to preserve and manage resources should be provided.
> 2. Heritage resources shall be preserved to the maximum extent possible for their scientific, cultural, or place values, and they shall not be diminished due to inadequate safeguards.
>
> Policy C-RC 2: The County shall provide leadership in efforts to protect or restore valuable natural resources, such as wetlands, riparian areas, and woodlands, and others:
>
> a. for County-owned lands; and
>
> b. through multi-jurisdictional endeavors.
>
> Policy C-RC 3: Multiple uses of lands intended for open space and conservation shall be encouraged so long as the uses are consistent with the objectives of resource management, conservation, and preservation, particularly habitat areas.

Policy C-RC 4: On a countywide basis, the overall strategy for resource management, conservation, and preservation should include the following:

a. improve and update current knowledge;

b. emphasize proactive, preventive measures;

c. minimize or compensate for adverse human impacts;

d. restore resources where possible; and

e. monitor the effectiveness of mitigations.

Implementation Recommendation C-RC (i) 1

Explore the use of joint agreements between the County, cities and LAFCO for the designation and protection of lands and resources of mutual interest and concern, where appropriate. Identify areas where County should exercise leadership.

These policies and recommendations are referred to in the Mineral Resources subsection where, directly within the context of discussing the existing Salt Ponds, the Plan states:

If discontinued for extraction purposes, future uses of the areas should be consistent with the resource conservation goals, objectives and policies intended to preserve the baylands environment in its natural state (p. H34).

More specifically, Mineral Resources Strategy #3 is to reclaim sites for appropriate subsequent use. It states:

Because the deposits are a finite resource, quarrying operations should only be considered a temporary land use, and adequate reclamation planning must be incorporated from the beginning of operations. In one sense, reclamation is one more aspect of mitigating environmental impacts after extraction operations are discontinued. Reclamation also functions to repair the site for appropriate subsequent uses (p. H35).

Mineral Resources Strategy #3 begets Policy C-RC 48: Reclamation for safe and beneficial future use of mineral resource extraction sites should be ensured through adequate planning, discretionary land use controls, and monitoring of reclamation plan implementation (p.H35).

Additionally, the Rural Unincorporated Area Issues and Policies Section also address the Baylands area, including them among the County's Critical Habitat Areas where the biological integrity should be protected. Pertinent policies acknowledge that the types of uses that are consistent with the overall goal of protecting the resource values of the Baylands are limited to habitat such as the National Wildlife Refuge, recreational uses, aquaculture, and other uses which do not adversely impact the ecological values of the remaining habitat areas. At the same time, pertinent policies also involve two related concepts, encouraging: 1) conservation of natural habitat areas intact, to avoid fragmentation and disturbance; and 2) maintenance of migratory corridors and linkages between natural areas to compensate for fragmentation (p. O 22–23).

Relevant policies with regard to the protection of the biological integrity of Critical Habitat areas include:

Policy R-RC 25: Wetlands habitats of San Francisco Bay shall be preserved and enhanced.

Policy R-RC 26: Within wetlands areas, allowable uses shall be limited to those which cause little or no adverse impacts, possibly including:

a. natural ecological functions, such as bay waters, sloughs, marshes and flats, preserved in open space;

b. salt ponds;

c. small piers, walkways, and wildlife observation areas;

d. trail-related uses, such as walking, bicycling, and, horseback riding as compatible with resource preservation;

e. fishing, boating, swimming, and limited hunting;

f. aquaculture;

g. marinas; and

h. nature centers or other facilities for the study and appreciation of natural resources.

Policy R-RC 27: There shall be no filling or alteration of wetlands areas except for such alterations which enhance habitat resources. Construction of small levees, piers, or walkways for public use and education may be allowed. If construction of any type will result in significant loss of habitat or alteration of wetlands hydrology, mitigations shall be required.

Policy R-RC 28: New marina locations in wetland areas should be considered only after upland alternatives have been determined infeasible. If new marinas are proposed, they shall not be allowed to create a net loss of habitat, through mitigation that requires creation or restoration of wetlands as compensation for losses incurred. Discontinued marinas shall be a priority for wetlands restoration and other uses compatible with habitat preservation.

Policy R-RC 29: No new or expanded landfill sites shall be approved which would adversely affect wetlands habitat. Closed landfills should be used as parks or open space compatible with habitat preservation goals.

Policy R-RC 30: Land uses in areas adjacent to the Baylands should have no adverse impact upon wetlands habitats or scenic qualities of the Baylands. Uses adjacent to the National Wildlife Refuge should be compatible with the Refuge.

While the above resource conservation measures set forth policies that suggest acceptable land uses, the following policies for the Baylands area – categorized in the Land Use section as a “Resource Conservation Area” – reiterate already established principles as land use policies (p.Q-1):

Policy R-LU 5: The edges of the San Francisco Bay shall be preserved and restored as open space. Allowable uses shall include:

a. bay waters and sloughs;

b. marshes, wetlands and wetlands restoration;

c. salt extraction;

d. wildlife habitat;

e. open space preserves;

f. small piers and walkways;

g. wildlife observation; and

h. recreational uses, such as walking, horseback riding, bicycling, fishing, boating, education, swimming, limited hunting, aquaculture, and marinas.

Policy R-LU 6: There shall be no filling of wetlands except for very limited construction of small levees, piers, or walkways necessary for public use or study of the baylands.

Policy R-LU 7: No new or expanded waste disposal sites shall be approved, and existing sites shall be converted into parks or open space when terminated for waste disposal.

City of Fremont. The City of Fremont General Plan was adopted on May 7, 1991 and updated in 2011. The City is divided into planning areas, one of which is the Baylands Planning Area which includes lands under the Bay, salt ponds, wetlands, seasonal wetlands, and other uses associated with the Bay and wildlife habitat.

The goals, policies and implementation measures contained in the Open Space Element related to salt ponds include the following (City of Fremont, 2011):

Goal 2-6: Open Space. An open space "frame" around Fremont, complemented by local parks and natural areas, which together protect the City's natural resources, provide opportunities for recreation, enhance visual beauty, and shape the City's character.

Policy 2-6.3: Baylands. Manage Fremont's Baylands as permanent open space. The habitat and ecological value of these areas should be conserved and restored to the greatest extent possible… Planning for the baylands should consider the effects of climate change and sea level rise.

Alviso Master Plan. The ponds are more specifically referred to in the Alviso Master Plan, which designates uses and policies pertinent to the section of incorporated San Jose immediately adjacent to the Alviso pond complex. The community of Alviso was incorporated into San Jose in 1968. The Alviso Master Plan – adopted in 1998 and addressed in the San Jose 2020 General Plan by way of the Alviso Planned Community (APC) – establishes a long-term development plan for the sensitive Alviso planning area by guiding appropriate new development, community facilities, infrastructure, and beautification (City of San Jose 1998). The majority of land uses allowed by the APC adjacent to the Alviso salt pond complex are Public Parks and Open Space, and Private Open Space.

City of San Jose. The Envision San Jose 2040 General Plan acknowledges that its park, trail, open space, recreation, and habitat resources contribute to the city's rating as one of the nation's healthiest cities (City of San Jose 2011). The plan sets the following goals, policies and implementation measures for the baylands:

Goal ER 3 – Bay and Baylands. Preserve and restore natural characteristics of the Bay and adjacent lands, and recognize the role of the Bay's vegetation and waters in maintaining a healthy regional ecosystem.

Policies – Bay and Baylands

ER-3.1. Protect, preserve and restore the baylands ecosystem in a manner consistent with the fragile environmental characteristics of this area and the interest of the citizens of San Jose in a healthful environment.

ER-3.2. Cooperate with the County, U.S. Army Corps of Engineers, EPA, California Department of Fish and Game, Bay Conservation and Development Commission, and other appropriate jurisdictions to prevent the degradation of baylands by discouraging new filling or dredging of Bay waters and baylands.

ER-3.3. In cooperation and, where appropriate, in consultation with other interested agencies and with projects such as the South Bay Salt Pond Restoration Project, encourage the restoration of diked historic wetlands, including salt ponds, to their natural state by opening them to tidal action.

ER-3.4. Avoid new development which creates substantial adverse impacts on the Don Edwards San Francisco Bay National Wildlife Refuge or results in a net loss of baylands habitat value.

ER-3.5. Prohibit planting of invasive non-native plant species in or near baylands habitats.

Goal ER-4 – Special-Status Plants and Animals

Preserve, manage, and restore habitat suitable for special-status species, including threatened and endangered species.

Policies – Special Status Plants and Animals

ER-4.1. Preserve and restore, to the greatest extent feasible, habitat areas that support special-status species. Avoid development in such habitats unless no feasible alternatives exist and mitigation is provided of equivalent values.

ER-4.2. Limit recreational uses in wildlife refuges, nature preserves and wilderness areas in parks to those activities which have minimal impact on sensitive habitats.

Goal ER-6 – Urban Natural Interface

Minimize adverse effects of urbanization on natural lands adjacent to the City's developed areas.

ER-6.2. Design development at the urban/natural community interface of the Greenline/Urban Growth Boundary (UGB) to minimize the length of the shared boundary between urban development and natural areas by clustering and locating new development close to existing development. Key areas where natural communities are found adjacent to the UGB include the Baylands in Alviso, the Santa Teresa Hills, Alum Rock Park, and Evergreen.

City of Mountain View. The City of Mountain View 2030 General Plan (City of Mountain View 2012) acknowledges that the SBSP Restoration Project "will restore vital habitat around the Bay" (City of Mountain View 2012). No mention of the salt ponds is made within the context of land use, though Goal POS 2.4 encourages access to the bay and other natural areas, and Goal POS 3 provides for protection of open space areas with natural characteristics (City of Mountain View 2012). Some of the City's natural resources, namely Shoreline Park and the Stevens Creek Nature Study Area, abut the Mountain View Ponds. Policy INC 16.2 encourages management of Shoreline at Mountain View Park to balance the needs of open space, habitat, commercial and other uses.

Ravenswood Ponds

San Mateo County. The Ravenswood Pond Complex is designated as Open Space in the San Mateo County General Plan. The San Mateo County General Plan was adopted in November, 1986. Goals relevant to the salt ponds are discussed in the Vegetative, Water, Fish and Wildlife Resources Policies section of the Land Use Element (San Mateo County 1986) which reads in part as follows:

1.1 Conserve, Enhance, Protect, Maintain and Manage Vegetative, Water, Fish and Wildlife Resources: Promote the conservation, enhancement, protection, maintenance and managed use of the County's Vegetative, Water, Fish and Wildlife Resources.

1.2 Protect Sensitive Habitats: Protect sensitive habitats from reduction in size or degradation of the conditions necessary for their maintenance.

1.4 Access to Vegetative, Water, Fish and Wildlife Resources: Protect and promote existing rights of public access to vegetative, water, fish and wildlife resources for purposes of study and recreation consistent with the need to protect public rights, rights of private property owners and protection and preservation of such resources.

1.29 Uses Permitted in Sensitive Habitats: Within sensitive habitats, permit only those land uses and development activities that are compatible with the protection of sensitive habitats, such as fish and wildlife management activities, nature education and research, trails and scenic overlooks and, at a minimum level, necessary public service and private infrastructure.

1.30 Uses Permitted in Buffer Zones: Within buffer zones adjacent to sensitive habitats, permit the following land uses and development activities: (1) land uses and activities which are compatible with the protection of sensitive habitats, such as fish and wildlife management activities, nature education and research, trails and scenic overlooks, and at a minimum level, necessary public and private infrastructure; (2) land uses which are compatible with the surrounding land uses and will mitigate their impact by enhancing or replacing sensitive habitats; and (3) if no feasible alternative exists, land uses which are compatible with the surrounding land uses.

1.38 Control Incompatible Vegetation, Fish and Wildlife: Encourage and support the control of vegetation, fish and wildlife resources which are harmful to the surrounding environment or pose a threat to public health, safety and welfare.

Resource Management Coordination

1.40 Encourage Coordinated, Countywide Management of Vegetative, Water, Fish and Wildlife Resources: Encourage all federal, state, regional, county, and city agencies with jurisdiction in

San Mateo County to cooperate and coordinate the management and protection of vegetative, water, fish and wildlife resources.

Acquisition and Management of Sensitive Habitats

1.41 Encourage Public Agencies and Private Groups to Acquire Significant Sensitive Habitats: Encourage public agencies and private groups to acquire and manage significant sensitive habitats because of the (1) biological and scientific significance of the habitat, (2) degree of endangerment from development or other activities, and (3) accessibility for educational and scientific uses and vulnerability to overuse.

1.44 Improvement of Damaged Resources: Encourage programs which repair and/or enhance damaged vegetative, water, fish and wildlife resources and sensitive habitats, with the goal of returning them to their natural condition.

1.48 Encourage the Management of Riparian Corridors: Encourage and, to the maximum extent feasible, reward the efforts of those responsible for managing riparian corridors in a manner that is consistent with County and state guidelines.

City of Menlo Park. The City of Menlo Park General Plan was adopted in 1994, and the Open Space/Conservation, Noise and Safety Elements were amended in 2013. The City's approach to natural resource conservation includes preserving "the natural state, unique appeal and visual amenities of Menlo Park's baylands and shoreline" (City of Menlo Park 2013). Goals relevant to the salt ponds are discussed in the Land Use Element, under the Open Space heading which reads in part as follows:

> OSC1.6. South Bay Salt Pond Restoration Project and Flood Management Project. Continue to support and participate in Federal and State efforts related to the South Bay Salt Pond Restoration Project and flood management project. Provide public access to the Bay for scenic enjoyment and recreation opportunities as well as conservation education opportunities related to the open Bay, the sloughs, and the marshes.

Additionally, in the Land Use/Circulation Diagrams and Standards section of the General Plan, the following is stated about Non-Urban Designations:

> Marshes: This designation provides for the preservation and protection of wildlife habitat and ecological values associated with the marshlands bordering San Francisco Bay and similar and compatible uses. The maximum amount of development allowed under this designation shall be 5,000 square feet of building floor area per parcel.

> Salt Ponds: This designation provides for the commercial production of salt and other minerals on the lands bordering San Francisco Bay and similar and compatible uses. The maximum amount of development allowed under this designation shall be 5,000 square feet of building floor area per parcel (City of Menlo Park 2013).

City of Redwood City. The City of Redwood City's General Plan was adopted in 2010. The City's approach to natural resource conservation includes "preserving, protecting, conserving, re-using, and efficiently using Redwood City's natural resources" (City of Redwood City 2010). Goals relevant to the salt ponds and the Don Edwards San Francisco Bay National Wildlife Refuge are discussed in the Natural Resources Element, which reads in part as follows:

Goal NR-5: Protect, restore, and maintain creeks, sloughs, and streams to ensure adequate water flow, prevent erosion, provide for viable riparian plant and wildlife habitat and, where appropriate, allow for recreation opportunities:

Policy NR-5.1: Restore, maintain, and enhance Redwood City's creeks, streams, and sloughs to preserve and protect riparian and wetland plants, wildlife and associated habitats, and where feasible, incorporate public access.

Goal NR-6: Preserve and enhance the baylands, natural wetlands, and ecosystem to assist with improved air quality and carbon dioxide sequestration. Additionally, in the Land Use/Circulation Diagrams and Standards section of the General Plan, the following is stated about Non-Urban Designations:

Policy NR-6.2: Restore and maintain marshlands including tidal flats, tidal marshes, and salt marshes as appropriate.

GOAL NR-7: Reduce pollution from stormwater runoff in our creeks and the San Francisco Bay.

3.8.3 Environmental Impacts and Mitigation Measures

Significance Criteria

For the purposes of this Final EIS/R, a significant land use and planning impact would occur if the project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

The SBSP Restoration Project area is designated by various jurisdictions as either open space lands or baylands. The Phase 2 project area is located within several different cities and counties. However, the project area is primarily under federal jurisdiction and not subject to county or city land use jurisdiction. In those areas included as part of Phase 2 that are subject to city or county plans, policies, or regulations, or that are under management of a special district (e.g., SCVWD), any applicable regulatory requirements and policy guidelines of those jurisdictions will be met and followed.

Further, regional plans and applicable general plans contain goals and policies which promote restoration of the salt ponds in the South Bay. The proposed SBSP Restoration Project long-term alternatives would be consistent with these land use plans or designations. Therefore, implementation of the project would not conflict with applicable land use plans or existing land use and zoning designations.

There are no habitat conservation plans or natural community conservation plans in place that cover the SBSP Restoration Phase 2 project area. The salt ponds are not located within an established community, and no actions under consideration would physically divide a community. Therefore, there is no further discussion of these topics and no need to include a full discussion of an impact related to them.

No important farmlands (prime farmland, farmland of statewide importance, unique farmland, or farmland of local importance) as identified by the Department of Conservation Farmland Mapping and Monitoring Program occur within the SBSP Restoration Phase 2 area. As such, no impacts to important farmlands would result from implementation of the Project.

Impact evaluations for the Action Alternatives are evaluated based on the existing conditions described in Section 3.8.2 above, and not the proposed conditions that would occur under the No Action Alternative. This approach is consistent with CEQA and NEPA protocol for analyzing project impacts. In this case, the No Action Alternative represents the continuation of current management direction or level of management intensity provided in the AMP into the future, with no change in that management.

As explained in Section 3.1.2, while both CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation

Three programmatic-level alternatives were considered and evaluated in the Programmatic EIS/R. This included: (A) the No Action Alternative; (B) the Managed Pond Emphasis; and (C) the Tidal Habitat Emphasis. At the program level, the decision was made to select Alternative C and implement Phase 1 actions. Programmatic Alternative C has been carried forward as Alternative A (No Action) in this EIS/R as it represents the continuation of existing conditions that would occur absent the implementation of one of the action alternatives for Phase 2. The Programmatic EIS/R evaluated the potential land use and planning impacts of three long-term alternatives. It was determined Alternative C would have no impact or less than significant impacts on land use and planning resources. The land uses proposed under Programmatic Alternative C would be similar to those described above for Programmatic Alternative B; however, the ratio of tidal habitat to managed ponds would be greater under Alternative C. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact. None of the alternatives would introduce land uses that would be incompatible with surrounding uses. Therefore, Programmatic Alternative C would not introduce land uses that would be incompatible with surrounding uses and impacts would be less than significant.

Project-Level Evaluation

Phase 2 Impact 3.8-1: Land use compatibility impacts.

Alviso-Island Ponds

Alternative Island A (No Action). The Programmatic EIS/R determined that Alternative A would have less than significant impacts on land use and planning resources as the project would be consistent with land use plans or designations in the project area. None of the activities that would occur would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP). Therefore, Alternative Island A would not introduce land uses that would be incompatible with surrounding uses and impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B would remove or lower the levees between and around portions of Ponds A19 and A20 to support hydrological connectivity and potentially improve the ecological function of both ponds. Island B ponds are designated as Open Space-Resource Conservation/Public. The removal of levees would not introduce a new land use type. No new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would include all of the components of Island B with the addition of three components: levee breaches on the north sides of ponds A20 and A21, pilot channels in Pond A19, and widening the existing breaches on the southern levee of Pond A19. These additional components are intended to accelerate the conversion of this pond cluster into tidal marsh. Similar to Alternative Island B, the ponds are designated as Open Space-Resource Conservation/Public. The ponds are closed to the public and are not used for recreation. The conversion of these ponds to tidal marsh and subsequent change in habitat type would not cause a land use compatibility impact. No new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). The Programmatic EIS/R determined that Alternative A would have less than significant impacts on land use and planning resources as the project would be consistent with land use plans or designations in the project area. None of the activities that would occur would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP). Therefore, Alternative A would not introduce land uses that would be incompatible with surrounding uses and impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under this alternative, Ponds A1 and A2W would be converted into tidal marsh, current levels of flood protection would be maintained through levee raising and other improvements, habitat transition zones and other habitat features would be added, and recreational opportunities would be increased through construction of a new trail, viewing platform, and interpretive recreation facilities. Land uses would remain similar to existing conditions, and would not change in the long term. The A8 Pond alternative would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP).Therefore, no new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under this alternative, Ponds A1, A2W, and the Charleston Slough would be converted to tidal marsh, current levels of flood protection would be maintained through levee raising and other improvements, habitat transition zone and other habitat features would be added, and recreational opportunities would be increased through construction of new trails, viewing platforms, and interpretive platforms. Currently, Charleston Slough is used by recreational users as a bird watching site. Converting this pond to a tidal marsh may alter its use by bird species, but would not change its land use designation and would be compatible with all applicable land use plans.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). The Programmatic EIS/R determined that Alternative A would have less than significant impacts on land use and planning resources as the project would be consistent with land use plans or designations in the project area. None of the activities that would occur would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP). Therefore, Alternative A would not introduce land uses that would be incompatible with surrounding uses and impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under this alternative, habitat transition zone would be constructed in Pond A8S's southwest corner and southeast corner. No land use designation changes are proposed by Alternative A8 B and no activities that could significantly affect land use compatibility (activities that generate a substantial amount of air quality, noise, or traffic) would occur. Land uses would remain similar to existing conditions, and would not change in the long term. Alternative A8 B would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP).Therefore, no new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). The Programmatic EIS/R determined that Alternative A would have less than significant impacts on land use and planning resources as the project would be consistent with land use plans or designations in the project area. None of the activities that would occur would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP). Therefore, Alternative Ravenswood A would not introduce land uses that would be incompatible with surrounding uses and impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under this alternative, R5 and S5 would become managed ponds, and R4 would become tidal marsh. No land use designation changes are proposed by Alternative Ravenswood B and no activities that could significantly affect land use compatibility (activities that generate a substantial amount of air quality, noise, or traffic) would occur. Flushing of historic slough channels within Pond R3 would be enabled as a result of the construction of a water control structure along the pond's border with Ravenswood Slough. Land uses would remain similar to existing conditions, and would not change in the long term. Alternative Ravenswood B would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP).Therefore, no new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. This alternative would be similar to Alternative Ravenswood B except that Ponds R5 and S5 would be converted to managed ponds at an elevation suitable for tidal mud flat hydrology and wildlife use. Additionally, flushing of historic slough channels within Pond R3 would be enabled as a result of the construction of a second water control structures along the pond's border with Pond S5. Recreational and access components would also be added as a result of this alternative. No land use designation changes are proposed by Alternative Ravenswood C and no activities that could significantly affect land use compatibility (activities that generate a substantial amount of air quality, noise, or traffic) would occur. Land uses would remain similar to existing conditions, and would not change in the long term. Alternative Ravenswood C would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP).Therefore, no new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. This alternative would be similar to Alternative Ravenswood B except that there would be more activities encouraging habitat restoration and improvements, stormwater detention capacity, flood control capability, and recreation and access. No land use designation changes are proposed by Alternative Ravenswood D and no activities that could significantly affect land use compatibility (activities that generate a substantial amount of air quality, noise, or traffic) would occur. Land uses would remain similar to existing conditions, and would not change in the long term. Alternative Ravenswood D would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigation an environmental impact (ISP and AMP).Therefore, no new land uses are proposed and impacts associated with land use compatibility would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.8-2. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the Adaptive Management Plan and other Refuge management documents and practices. The land use analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.8-2 Phase 2 Summary of Impacts – Land Use

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.8-1: Land use compatibility impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA).
LTS = Less than Significant

3.9 Public Health and Vector Management

This section of the Final EIS/R describes the existing public health and vector management within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on public health and vector management from project implementation. The information presented is based on a review of existing public health and vector management within the area, and other pertinent federal, state and local regulations, presented in the regulatory framework setting section. Using this information as context, an analysis of public health and vector management-related environmental impacts of the project is presented for each alternative. Mitigation measures described in Chapter 2 would be implemented with the project. Therefore, this section only includes additional mitigation measures as needed.

3.9.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). The baseline condition specific to the pond clusters is based on the current condition of these areas. This is based on information and data gathered for preparation of this Final EIS/R.

Regional Setting

As stated in the Programmatic EIS/R for the SBSP Restoration Project, there are five species of mosquitoes that are routinely controlled by the mosquito and vector control agencies in the South San Francisco Bay area: the summer salt marsh mosquito (*Aedes dorsalis*), winter salt marsh mosquito (*Aedes squamiger*), Washino's mosquito (*Aedes washinoi*), western encephalitis mosquito (*Culex tarsalis*), and winter marsh mosquito (*Culiseta inornata*).

The ecology of these mosquitoes is summarized in the Programmatic EIS/R. All five of these species can be found in the Refuge, and individuals can disperse distances that are large enough for breeding populations to migrate into the Refuge from other areas or to disperse from the Refuge into other locations. None of these species are specific to the Refuge. Within the SBSP Restoration Project Area, the Alameda County Mosquito Abatement District, Santa Clara Vector Control District, and San Mateo County Mosquito Abatement District are responsible for managing the populations of mosquitoes for their respective communities.

Project Setting

Potential habitats for several mosquito species are found in the Phase 2 pond clusters. These species are described in detail in the Programmatic EIS/R for the SBSP Restoration Project. Table 3.10-1 of the Programmatic EIS/R listed the habitat types in the SBSP Restoration Project and the mosquito species associated with those habitats. A similar table is provided in Table 3.9-1, below. Table 3.9-1 also identifies which ponds in Phase 2 correspond with which habitat under the existing conditions. Refer to Section 3.5.1 in Section 3.5, Biological Resources, for a detailed description of the habitats present in the Phase 2 pond clusters.

Table 3.9-1 Mosquito Species Found in Marsh Habitats in the SBSP Restoration Project Phase 2 Area

HABITATS	MOSQUITO SPECIES	PHASE 2 POND CLUSTER
Open salt pond with vigorous wave action, tidal mudflat, high salinity salt ponds	none	Mountain View Ponds (Ponds A1 and A2W; Charleston Slough); Ravenswood Ponds (S5, R5, R3 and R4).
Fully tidal salt marsh: Higher ground with pools or borrow channels that do not flush	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)	Island Ponds ; Mountain View Ponds (fringe marsh); Ravenswood Ponds (fringe marsh and Flood Slough)
Muted tidal salt marsh: Pools and channels that do not flush vigorously	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)	A8 Ponds
Seasonal wetland: Brackish to nearly fresh water pools with vegetated margins	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Aedes washinoi* (winter fresh water), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)	None
Vernal pools, upland fresh water marsh	*Aedes washinoi* (winter), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)	None

Tidal marshes that lack vigorous tidal flow can provide suitable mosquito breeding habitat. Functional tidal marshes with vigorous tidal flows do not provide high-quality habitat for the most troublesome mosquito species in the Bay Area, and maintenance and restoration of natural tidal flushing in these marshes is effective at limiting mosquito populations while sustaining the natural hydrology of the marsh (San Francisco Bay Joint Venture 2004, as cited in the 2007 EIS/R). Salt marshes at the southern end of San Francisco Bay that do not have vigorous tidal flow produce a single seasonal brood of the winter salt marsh mosquito and multiple broods of the summer salt marsh mosquito each season.

The mosquito and vector control management that occurs within the SBSP Restoration Project Area is consistent with the Refuge Mosquito and Mosquito-Borne Disease Management Policy and the Comprehensive Conservation Plan (CCP), is conducted by the local mosquito abatement districts (MADs), and follows the AMP techniques. The Refuge staff coordinates annually with the MADs to allow the monitoring and, if necessary, control of mosquitoes on the Refuge to minimize public health risks from mosquito-borne diseases. Wetland management BMPs for proactive mosquito control are regularly used. These include, but are not limited to, water management techniques, and maintenance and improvement of water control structures. Refuge staff coordinates with the MADs on timing of irrigations, flood-up schedules, and communication of any problems with unplanned flooding. The goal of the Vector Control portion of the AMP is to maintain or improve current levels of vector management. Through the AMP, mosquito and vector control focuses on monitoring for specific triggers and implementing management actions after a trigger has been signaled. Monitoring protocols have been employed to pinpoint problem areas for vector management. Monitoring parameters include:

- Presence/absence of mosquitoes in former salt ponds
- Number of acres of breeding mosquitoes
- Number of larvae/dip in potential breeding habitat
- Number of acres within the project area treated for mosquitoes
- Costs/level of effort (e.g., hours spent in treatment, amount of material applied, helicopter cost, etc.) to control mosquitoes

If any of the Vector Control AMP management triggers are signaled, AMP management actions are deployed. Management actions are triggered when the following circumstances are discovered as a result of monitoring:

- Detection of breeding mosquitoes in a former salt pond;
- Detectable increase in monitoring parameters (relative to the baseline), particularly in areas with human activity/exposure; and
- Detection of mosquitoes that are known disease vectors and/or are of particular concern (i.e., *Aedes squamiger, A. dorsalis*) in the Project Area.

The AMP lists and describes the following vector control management actions and directs implementation of the following activities when necessary:

- Adjust design to enhance drainage or tidal flushing, control vegetation in ponded areas, and/or facilitate access (for control) to marsh ponds
- Increase level of vector control (preferably only as an interim measure while design issues are addressed to reduce mosquito breeding habitat)
- Study relationships of fish abundance and community composition and mosquito larval abundance in marsh features (e.g., ponds and pannes) and managed ponds
- Ensure management actions throughout implementation of the AMP are consistent with Refuge mosquito management policies

In addition to the actions listed in the AMP, the Refuge will continue to work with the mosquito abatement districts to develop designs that minimize the risks of developing breeding habitat and that allow access to the restoration areas for mosquito monitoring and control.

Vector control of the portions of the project area located outside of the Refuge are under the jurisdiction of the applicable MAD. For example, vector control of Charleston Slough, which is part of the Alviso-Mountain View Pond cluster, is implemented by the Santa Clara County Vector Control District. Vector control of Flood Slough, which is part of the Ravenswood Pond cluster, is implemented by the San Mateo County Mosquito Abatement District. These local agencies employ similar methods for vector control at these locations as they employ within the Refuge through implementation of the CCP and AMP.

Mosquito control techniques employed by the MADs and the Refuge emphasize minimization and disruption of suitable habitat, and control of larvae through chemical and biological means, as opposed to spraying of adults. Control techniques most often include source reduction, source prevention, larviciding, use of predatory fish, and use of bacteria that are toxic to mosquito larvae. The MADs thereby minimize the number and severity of mosquito outbreaks and to address those that do occur. The environmental baseline does not have significant mosquito-control or vector-related public health problems, particularly not within the Phase 2 project areas, which are public spaces and do not have homes or businesses within them.

3.9.2 Regulatory Setting

Mosquito management that occurs within the Refuge is consistent with the Refuge Mosquito and Mosquito-Borne Disease Management Policy (draft October 2007), and management that occurs in the Phase 2 project areas outside of the Refuge boundaries are consistent with the policies of the local MADs. The activities of MADs are governed by Federal and State regulations including the CWA, ESA, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), California Health and Safety Code, and California Food and Agriculture Code.

The MADs discharge aquatic pesticides and biological control into Waters of the United States pursuant to the NPDES permit program. These permits are occasionally amended or replaced.

The MADs follow specific protocol to avoid affecting endangered species. Within the Refuge, they coordinate with the Refuge staff and follow protocols dictated by the general operations and maintenance of the Refuge and the AMP for Vector Control to avoid effects to sensitive species or their habitat (i.e. nesting birds or endangered species habitat) when conducting vector control activities. Additional procedural processes are necessary, including consultation with wildlife agencies, if an endangered species or designated critical habitat would be adversely affected from vector control activities, which would result in additional measures to be implemented to minimize affects to endangered species or designated critical habitat.

Per FIFRA, any pesticide that is used must be licensed by the EPA Environmental Protection Agency and used in accordance with the specifications and labeled directions. Additionally, MADs can only use pesticides that are registered for use in California. Individuals must be certified by the California Department of Health Services to apply pesticides or work under the direct supervision of somebody that is certified (CDPH 2005).

3.9.3 Environmental Impacts and Mitigation Measures

Overview

The thresholds of significance for potential Phase 2 impacts to public health and vector management follow. The rationale for the potential impacts as they relate to the significance criteria can be found in Section 3.10.3 of the PEIS/R and in summary form below. In tiering from the PEIS/R, the impacts and analysis for Phase 2 matches the style, format, and content contained in the PEIS/R and considers new effects under Phase 2 that had not been specifically considered in the PEIS/R.

Significance Criteria

The threshold of significance is defined in the Programmatic EIS/R as a substantial increase in the need for vector management activities in any of the Phase 2 Project Areas as a result of Phase 2 activities.

As explained in Section 3.1.2, while both CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation Summary

The determination was made in the SBSP Restoration Project Programmatic EIS/R that under the implementation of Programmatic Alternative C, there would be a less than significant impact to public health and vector management. The alternative would result in a less than significant increase in mosquito populations and would not result in a substantial increase in the need for vector management activities through the implementation of the AMP.

Project-Level Evaluation

Phase 2 Impact 3.9-1: Potential increase in mosquito populations.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, Ponds A19, A20, and A21 would continue to receive tidal action through their existing levee breaches. These ponds are currently partially covered with marsh vegetation, partially sediment or bare ground, and partially water-filled. The relative amounts of each of these cover types varies with the tide stage, though sediment and marsh vegetation have been increasing since these ponds were breached in 2006. Under Island A, the ponds would continue to transition to tidal marshes and the existing breached levees would naturally degrade. The continual transition of these ponds to tidal marshes would likely result in a slight decrease in potential mosquito breeding habitat because the ponds could be flushed more thoroughly with the tides.

Mosquito and vector management would continue to follow the Vector Control AMP and the general operations and maintenance of the Refuge, as described above, and be in accordance with current USFWS practices. Because no new construction would occur under Alternative Island A, the AMP management actions would be limited to adjusting the level of vector control at the ponds as needed and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the established AMP management triggers would lead to the implementation of the AMP management actions early enough to avoid substantial increases in the need for vector management activities. They would also minimize potential increases in mosquito populations. Therefore, impacts under Alternative Island A would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. The Alviso-Island Ponds would continue to receive tidal action under Alternative Island B. This alternative would result in an increase of tidal flushing for Ponds A19 and A20 (but not A21) and all ponds would continue to transition into tidal marshes. The transition of these ponds to tidal marshes with an increase in tidal action would likely result in a decrease in potential mosquito breeding habitat because the ponds would be flushed more thoroughly with the tides, especially for Ponds A19 and A20 in comparison to Alternative Island A.

As described in more detail above in the analysis for Alternative Island A, mosquito and vector management would continue to follow Vector Control AMP and the general operations and maintenance of the Refuge. Differing from Alternative Island A, for Ponds A19 and A20, AMP management actions could include adjustments in the construction design and implementation to enhance pond drainage or tidal flushing. This activity would not occur at Pond A21 because no construction is proposed for this pond under this alternative. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Island B would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The Alviso-Island Ponds would continue to receive tidal action under Alternative Island C. Compared to Alternative Island A and Alternative Island B, this alternative would result in an increase of tidal flushing for all three ponds and all ponds would likely transition more rapidly into tidal marshes compared to the other alternatives. The proposed breaches and lowering of various levees and creation of pilot channels in Pond A19 would result in an increase in tidal flushing for the Island Ponds. The transition of these ponds to tidal marshes with an increase in tidal action and tidal flushing would result in a general decrease in potential mosquito breeding habitat in comparison to Alternative Island A and Alternative Island B.

Similar to the other alternatives for the Island Ponds and as described in more detail above in the analysis for Alternative Island A, mosquito and vector management would continue to follow the Comprehensive Conservation Plan, the general operations and maintenance of the Refuge, and the AMP for Vector Control. AMP management actions could include adjustments in the construction design and implementation to enhance pond drainage or tidal flushing. Because of the extent of construction at the ponds under this alternative, this alternative would allow for the most opportunity to adjust the design for the most optimized drainage and tidal flushing that would allow for optimal future vector control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Island C would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, Ponds A1 and A2W would remain partially managed ponds, and the fringing marsh outside of the ponds and sloughs levees, Permanente Creek, and Mt. View Slough would continue to exist in their current state. Mosquito and vector management would continue to follow the Vector Control AMP and the general operations and maintenance of the Refuge. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View A would be less than significant. Under this alternative, Charleston Slough would continue to be managed and maintained as it currently is by the City of Mountain View and would not be managed under the purview of the AMP.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Ponds A1 and A2W would be breached to open them to tidal action under Alternative Mountain View B. This would begin their transition into tidal marshes. Opening these ponds to tidal flows would likely result in an increase in mosquito habitat relative to the existing conditions. As outlined in Table 3.9-1, tidal marshes (once they are established) are suitable habitat for some mosquito species, while the currently large salt ponds with vigorous wind action provide minimal habitat. Thus, there could be an increase the potential habitat for some types of salt marsh mosquito species. Also, constructing new upland areas (e.g., habitat transition zones) that would pool water could likely result in an overall increase in potential mosquito breeding habitat if they are not designed, constructed, and maintained so that water does not pool in them and allow mosquito breeding.

Similar to Alternative Mountain View A, mosquito and vector management would continue to follow general operations and maintenance of the Refuge and the AMP for Vector Control. Upland transition zones, habitat islands, and the raised levee could potentially provide depressions that could fill with water and support mosquitoes, but through the implementation of the AMP, the design of these upland areas would be designed to enhance drainage. Additionally, the upland transition zones and raised levee would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Ponds A1 and A2W would be breached to open them to tidal action under Alternative Mountain View C and would begin transition into tidal marshes. The removal of the existing tide gate/water control structure at Charleston Slough would open the slough to tidal flows. The ability for these water bodies to flush with the tide and the construction and maintenance of new upland areas (e.g., habitat transition zones) that would not pool water would likely result in an overall decrease in potential mosquito breeding habitat for the salt marsh mosquito species as outlined in Table 3.9-1. Compared to Alternative Mountain View B, this alternative would result in a more thorough tidal flushing and would result in a greater decrease in potential mosquito breeding habitat in comparison to Alternative Mountain View B.

The AMP and the general operations and maintenance of the Refuge would be implemented in the same manner as described above under Alternative Mountain View B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers,) to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, the A8 Ponds would continue to function as muted tidal marsh. Mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge for Vector Control. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector

Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative A8 A would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. The Alviso-A8 Ponds would remain muted tidal marsh under Alternative A8 B. The habitat transition zones would be designed, constructed, and managed to not allow for the development of depressions or pools in which water would collect and in which mosquitoes could breed.

Similar to Alternative A8 A, mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge, and the AMP for Vector Control. The continual implementation of the AMP would dictate that the proposed upland transition zones and alteration of the pond bottoms would be designed to enhance drainage. Additionally, the habitat transition zones would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers and would avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative A8 B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, the Ravenswood Ponds would continue to exist in their current state as seasonal ponds that receive rainfall and some runoff in the winter. Mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge for vector control. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood A would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. The change in function of several ponds in the Ravenswood Ponds under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool.

The opening of Pond R4 to tidal action would begin transition of this pond to tidal marsh, and alteration of the pond bottom would allow tidal flushing of the pond. As the salinity of Pond R4 decreases and full tidal flushing occurs, the pond would likely transition to become new mosquito breeding habitat for salt marsh mosquito species as outlined in Table 3.9-1. The proposed habitat transition zones would be designed, constructed, and maintained to not allow the development of depressions or pools in which water would collect and in which mosquitoes could breed.

The change in management of Ponds R5 and S5 from high salinity seasonal ponds to managed pond habitat would result in deeper water in the ponds. Vegetation management could be necessary on the created island. The change in water management in these ponds would likely result in no measureable changes in the amount of potential breeding habitat.

Potential mosquito breeding habitat would not change for Pond R3 or any of the adjacent sloughs that are part of the Ravenswood Ponds. However, the addition of a water control structure to Pond R3 could enable better active management of water levels and salinity in Pond R3, which could potentially limit the availability of breeding habitat in the pond. The use of a water control structure or tide gate between Flood Slough and Ponds R5and S5 would not change the mosquito habitat in Flood Slough because the slough would continue to function as a tidal marsh, and Ponds R5 and S5 would be managed to avoid increasing habitat.

Similar to Alternative Ravenswood A, mosquito and vector management would continue to follow the general operations and maintenance of the Refuge and the AMP for Vector Control. Implementation of the AMP would result in the design of upland areas, including upland transition zones, habitat islands, and levees to have enhanced drainage and have minimal locations for new mosquito breeding habitat. Additionally, the upland transition zones and raised levee would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The change in function of several ponds in the Ravenswood Pond Cluster under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool. The effects to mosquito breeding habitat and vector control under this alternative would be very similar as described under Alternative Ravenswood B.

Over time at Pond R3, the salinity of water in the pond could be reduced and pooled water in the pond could become new mosquito breeding habitat for salt marsh mosquito species; however, the active management of water levels in Pond R3 would allow for control of the water in the pond and could potentially limit the availability of breeding habitat in the pond. At Pond R4, tidal flushing would likely be more thorough under this alternative because of the additional levee breach, which would further reduce potential mosquito breeding habitat compared to Alternative Ravenswood B.

The general operations and maintenance of the Refuge and the AMP would be implemented in the same manner as described above under Alternative Ravenswood B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood C would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The change in function of several ponds in the Ravenswood Ponds under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool. The effects to mosquito breeding habitat and vector control under this alternative would be very similar as described under Alternative Ravenswood B and Alternative Ravenswood C except for Pond R4. Compared to the other action alternatives, tidal flushing would be less in Pond R4 because there would only be a single point (levee breach) for tidal activity to regularly enter and exit the pond. This would result in less tidal exchange in the pond, and, compared to other alternatives, there would be a greater potential for mosquito breeding habitat to develop.

The general operations and maintenance of the Refuge and the AMP would be implemented in the same manner as described above under Alternative Ravenswood B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood D would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.9-2. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features and the Adaptive Management Plan and other Refuge management documents and practices. The Public Health and Vector Management analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.9-2 Phase 2 Summary of Impacts – Public Health and Vector Management

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.9-1: Potential increase in mosquito populations.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Notes: Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA). LTS = Less than Significant												

3.10 Socioeconomics and Environmental Justice

This section of the Final Environmental Impact Statement/Environmental Impact Report (Final EIS/R) characterizes the existing socioeconomic and environmental justice conditions within the Phase 2 project area and analyzes whether the project would cause a substantial adverse effect on population, employment, housing, or minority and low-income populations in the project area. The information presented is based on a review of existing socioeconomic data for the project area and other pertinent federal, state and local regulations, which are presented in the regulatory framework setting section. Using this information as context, an analysis of the socioeconomic and environmental justice environmental impacts of the project is presented for each alternative. Program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only discusses additional mitigation measures as needed.

3.10.1 Physical Setting

Methodology

Socioeconomics

The socioeconomic analysis describes the potential impacts of the project on population growth, employment, and housing in the counties, cities, and census tracts within 1 mile of the edge of each of the pond clusters included in Phase 2. Impacts to the socioeconomic climate are also covered to the extent that the project relates to the businesses in the surrounding communities. Local citywide populations, defined as those cities with a census tract within 1 mile of the edge of each Phase 2 pond cluster, are as follows:

- Alviso-Island Ponds: Fremont; Alviso-Mountain View Ponds: Palo Alto, Mountain View, and Sunnyvale;
- Alviso-A8 Ponds: Sunnyvale, Santa Clara, and San Jose; and
- Ravenswood Ponds: Redwood City, Menlo Park, and East Palo Alto.

Environmental Justice

This subsection provides an overview of minority and low-income populations in the Phase 2 area of the SBSP Restoration Project. Specifically, data from the 2010 Census and 2006–2010 American Community Survey are presented to demonstrate the difference, if any, between percentage of minority and low-income populations in census tracts within 1 mile of the edge of each of the four pond clusters and the percentage of those same populations in the cities within 1 mile of the edge of each of the pond clusters.

Project Setting

Socioeconomics

The Phase 2 pond clusters are in four separate locations. The socioeconomic climate around these project areas are those of developed communities, as shown by the low population increases in the past 10 years (Table 3.10-1). Employment has remained consistent through the 10-year period. Of the four pond clusters assessed in Phase 2, only the Ravenswood pond cluster has a large percentage (32.7 percent) of a local citywide population within 1 mile of the cluster (East Palo Alto). The remaining three pond clusters all have a low percentage of the citywide population within 1 mile of the edge of the ponds (Table 3.10-2).

Table 3.10-1 County and City Populations and Labor Forces

CITY AND COUNTY	POPULATION		EMPLOYED POPULATION	
	2000	2010	2000	2010
San Mateo County	707,161	718,451	361,640	360,951
Redwood City	75,402	76,815	40,100	37,869
Menlo Park	30,785	32,026	15,429	15,811
East Palo Alto	29,506	28,155	11,349	12,473
Santa Clara County	1,682,585	1,781,642	843,912	843,854
Palo Alto	58,598	64,403	31,369	30,047
Mountain View	70,708	74,066	41,126	40,539
Sunnyvale	131,760	140,081	72,756	70,911
Santa Clara	102,361	116,468	55,528	57,175
San Jose	894,943	945,942	436,890	446,962
Alameda County	1,443,741	1,510,271	692,833	716,257
Fremont	203,413	214,089	102,187	103,208
Sources: U.S. Census Bureau 2000a, 200b, 2010.				

Table 3.10-2 Phase 2 SBSP Project Census Tract Population

POND CLUSTER	LOCAL CITYWIDE POPULATION	POPULATION IN SBSP CENSUS TRACTS (WITHIN 1 MILE OF PONDS)	PERCENT OF CITYWIDE POPULATIONS IN SBSP CENSUS TRACTS (%)
Alviso-Island Ponds	214,089 [1]	7,533	3.5
Alviso-Mountain View Ponds	278,550 [2]	18,243	6.6
Alviso-A8 Ponds	1,202,491 [3]	28,677	2.4
Ravenswood Ponds	136,996 [4]	44,813	32.7

Notes:
[1] Made up of Fremont.
[2] Made up of Palo Alto, Mountain View, and Sunnyvale.
[3] Made up of Sunnyvale, Santa Clara, and San Jose.
[4] Made up of Redwood City, Menlo Park, and East Palo Alto.

Environmental Justice

Table 3.10-3 compares the percentage of non-white residents living in census tracts within 1 mile of the four pond clusters with the percentage of non-white residents in the surrounding cities. Only the Alviso-Island Ponds show a higher percentage of non-white residents within 1 mile of the ponds than in the surrounding cities. Figure 3.10-1 shows the concentrations of non-white residents in SBSP census tracts. Table 3.10-4 compares the percentage of individuals living below the poverty level (according to the 2006–2010 American Community Survey) in census tracts that are within 1 mile of the pond clusters with the percentage of individuals living below the poverty level in the surrounding cities. Both the Alviso-Island Ponds and the Ravenswood Ponds show a higher percentage of individuals living below the poverty level within 1 mile of the ponds than in the surrounding cities.

Table 3.10-3 Phase 2 SBSP Project Non-White Population

POND CLUSTER	PERCENT OF CITYWIDE POPULATION THAT IS NON-WHITE	SBSP CENSUS TRACT POPULATION THAT IS NON-WHITE
Alviso-Island Ponds	73.5 [1]	80.6
Alviso-Mountain View Ponds	56.4 [2]	47.3
Alviso-A8 Ponds	69.9 [3]	60.6
Ravenswood Ponds	59.6 [4]	51.8

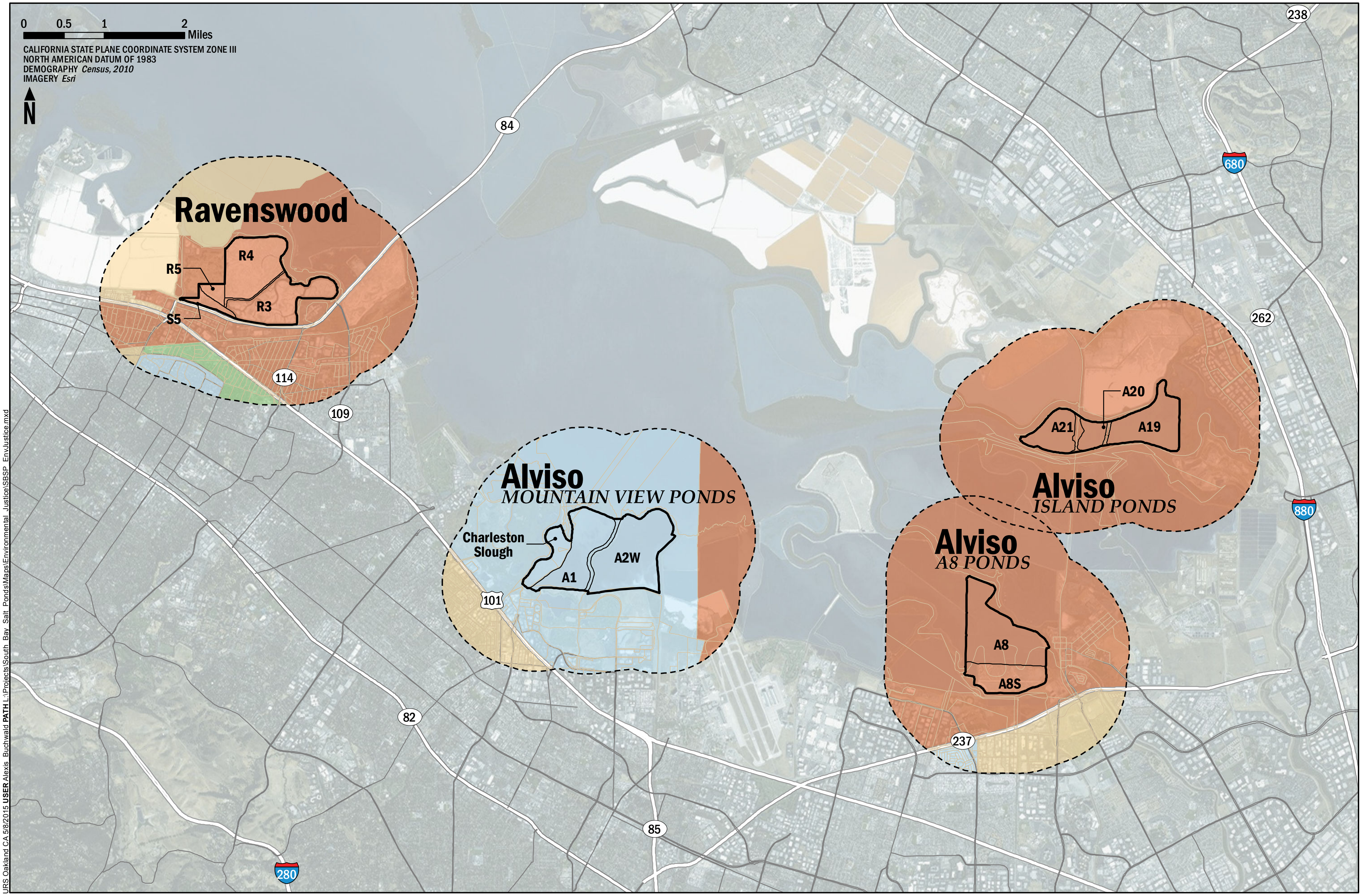
Notes:
[1] Made up of Fremont.
[2] Made up of Palo Alto, Mountain View, and Sunnyvale.
[3] Made up of Sunnyvale, Santa Clara, and San Jose.
[4] Made up of Redwood City, Menlo Park, and East Palo Alto.

Table 3.10-4 Phase 2 SBSP Population Below Poverty Level

POND CLUSTER	PERCENT OF CITYWIDE POPULATION THAT IS BELOW POVERTY LINE	SBSP CENSUS TRACT POPULATION THAT IS BELOW POVERTY LINE
Alviso-Island Ponds	5.2 [1]	7.8
Alviso-Mountain View Ponds	6.0 [2]	5.7
Alviso-A8 Ponds	9.7 [3]	6.8
Ravenswood Ponds	9.9 [4]	14.9

Notes:
[1] Made up of Fremont.
[2] Made up of Palo Alto, Mountain View, and Sunnyvale.
[3] Made up of Sunnyvale, Santa Clara, and San Jose.
[4] Made up of Redwood City, Menlo Park, and East Palo Alto.

For the purposes of this analysis, an area with a non-white population exceeding 50 percent and higher than that of the citywide population is considered to have a minority population. By that definition, only the areas nearby the Alviso-Island Ponds would have a minority population. Low-income areas are defined as those where the percentage of the population below the poverty line exceeds the citywide average. Both the Alviso-Island Ponds and the Ravenswood Ponds have nearby populations classified as low-income areas under this definition.



LEGEND

- 1-Mile buffer of Project Area
- Phase 2 Project Area
- Census block

Environmental Justice
by Census block

- 1 - Low Minority Density
- 2 - Medium Low Minority Density
- 3 - Medium High Minority Density
- 4 - High Minority Density

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Figure 3.10-1
Census Block Minority Population Densities In Comparison To Surrounding Cities

3.10.2 Regulatory Setting

Relatively few of the cities that surround the SBSP Restoration Project include relevant strategies, policies, or implementation measures pertaining to environmental justice in their general plans. Those that do are discussed below.

Federal Regulations

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), requires all federal agencies to seek to achieve environmental justice by "…identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations."

State Regulations

There are no specific requirements for the analysis of socioeconomic and environmental justice issues under state law. California Environmental Quality Act (CEQA) Guidelines Section 15131(a) through (c) provides guidance on the discussion of economic and social effects in an Environmental Impact Report (EIR) (AEP 2014). Specifically, such effects may be included in an EIR but "shall not be treated as significant effects on the environment." However, economic and social effects may be used to determine the significance of physical changes caused by a project, but these changes "need not be analyzed in any detail greater than necessary to trace the chain of cause and effect." CEQA Guidelines provide for the consideration of economic, social, and particularly housing factors, together with technological and environmental factors, to determine whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR.

Regional/Local Regulations

This section discusses the policies related to socioeconomics and environmental justice in the cities surrounding the Phase 2 activities.

City of San Jose. The Housing Goals in the Envision San Jose 2040 General Plan (City of San Jose 2011) provides the following goal pertaining to environmental justice:

Housing Goal:

H-1.1 Through the development of new housing and the rehabilitation of existing housing, facilitate the creation of economically, culturally, and demographically diverse and integrated communities.

City of Santa Clara. The Residential Land Use Goals and Policies of the City of Santa Clara General Plan (City of Santa Clara 2010) provide the following goals pertaining to environmental justice:

5.3.2-G1**:** Equitable housing opportunities within the community for persons of all economic levels, regardless of religion, gender, sexual orientation, marital status, national origin, ancestry, familial status, race, color, age, source of income or mental or physical disability.

City of Sunnyvale. The Housing Element of the City of Sunnyvale General Plan (City of Sunnyvale 2011) includes the following relevant goals, policies, and action statements related to environmental justice:

> GOAL HE-1: Adequate Housing — Assist in the provision of adequate housing to meet the diverse needs of Sunnyvale's households of all income levels.
>
> Policy HE-1.2: Facilitate the development of affordable housing through regulatory incentives and concessions, and/or financial assistance.
>
> Policy HE-1.3: Utilize the Below Market Rate Housing requirements as a tool to integrate affordable units within market rate developments, and increase the availability of affordable housing throughout the community.
>
> Policy HE-1.4: Continue to require office and industrial development to mitigate the demand for affordable housing.
>
> GOAL HE-5: Equal Housing Opportunities — Promote equal housing opportunities for all residents, including Sunnyvale's special needs populations, so that residents can reside in the housing of their choice.
>
> Policy HE-5.2: Implement City ordinances regarding prohibition of discrimination in housing.
>
> Policy HE-5.4: Continue to address the special needs of persons with disabilities through provision of supportive housing, accessibility grants, and development of procedures for reasonable accommodation.

City of Redwood City. The Redwood City General Plan (adopted October 11, 2010) (City of Redwood City 2010) does not provide relevant goals or policies associated with environmental justice.

City of East Palo Alto. The Economic Development Element of the City of East Palo Alto General Plan (City of East Palo Alto 1999) provides the following policy pertaining to environmental justice:

> Policy 3: The City shall actively encourage the development of new housing and rehabilitation of existing units which shall be affordable to very low and low income households based on East Palo Alto levels of affordability. Additionally, all residents displaced by a redevelopment project shall be given the opportunity to live within City boundaries in housing they can afford.

3.10.3 Environmental Impacts and Mitigation Measures

Significance Criteria

For the purposes of this Final EIS/R, the project would have a significant impact if it would result in the following:

- Displace, relocate, or increase area businesses because of the expected increase in recreational users;
- Change lifestyles and social interactions;
- Disproportionately affect minority communities or low-income communities;

- Change the ethnic or racial composition in the community; or
- Change local employment opportunities or community tax bases.

The significance criteria identified above are established based on EO 12898 and the Environmental Impact Checklist for some of the More Common Social Concerns in the United States Fish and Wildlife Service (USFWS) Reference Handbook (USFWS. 2007). Because CEQA does not identify social and economic effects as significant, National Environmental Policy Act (NEPA) regulations were used to determine potential effects. The Phase 2 SBSP Restoration Project would not substantially affect local employment opportunities or change the community tax base. Therefore, this significance criterion is not discussed below.

Program-Level Evaluation Summary

The 2007 EIS/R assessed the impact of the three program-level alternatives. In all of these alternatives, the assessment showed that no construction or demolition of any facilities that would change the community tax base would occur. That document also stated that Programmatic Alternative A would not affect local employment opportunities but that there may be minor increases in local employment opportunities associated with management of the tidal habitat/ponds and new recreational facilities under Programmatic Alternatives B and C. However, the creation of additional jobs at USFWS and the California Department of Fish and Game (CDFG) (now the California Department of Fish and Wildlife [CDFW]) (the managing agencies), if any, would not substantially affect local employment opportunities.

As explained in Section 3.1.2, although both the Council for Environmental Quality (CEQ) Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology, but NEPA regulations were used to determine potential effects. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Project-Level Evaluation

Phase 2 Impact 3.10-1: Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.

Alviso-Island Ponds, Alviso-Mountain View Ponds, Alviso-A8 Ponds, and Ravenswood Ponds—Alternatives A (No Action)

Under Alternatives Island A, Mountain View A, A8 A, and Ravenswood A, no new activities would occur as part of Phase 2. These are the No Action Alternatives for each of these pond clusters.[1] The pond clusters would continue to be monitored and managed through the activities described in the Adaptive Management Plan (AMP) and in accordance with current USFWS practices. Recreation activities would remain similar to existing conditions, and would not be expected to change business conditions in the long term. Therefore, no impact to area businesses would occur, and there would be few, if any, substantial changes in the local employment opportunities or community tax bases.

No Action Alternatives Level of Significance: No Impacts

1 "No Action Alternative" is the NEPA term. It corresponds to CEQA's "No Project Alternative" term. This Final EIS/R uses No Action throughout.

Action Alternatives

The Action Alternatives for Phase 2 are Alternatives Island B, Island C, Mountain View B, Mountain View C, A8 B, Ravenswood B, Ravenswood C, and Ravenswood D. These alternatives propose the construction of a range of new recreational and public access facilities at two of these pond clusters. The exceptions are the Alviso-Island pond cluster and the A8 pond cluster, where no changes to public access are proposed. As such, the Phase 2 Action Alternatives (Alternatives Island B, Island C, and A8 B) would have no effect on recreational use and thus no impacts on area businesses associated with recreational use. The remainder of this section addresses the Action Alternatives at the Mountain View and Ravenswood Ponds.

The construction of Phase 2 actions would result in some new recreation facilities. An increase in the number of recreational and public access facilities as a result of the Action Alternatives could—in conjunction with the currently existing uses—incrementally increase activity at businesses associated with recreational users. These facilities would be primarily an extension of existing services (e.g., viewing platforms, interpretative stations, and some new trails) and would not be expected to substantially increase the recreational uses of the facilities. (Estimates of the numbers of new users are presented in Section 3.6, Recreation Resources and the associated technical appendix.) Business activity at surrounding businesses that cater to these recreational users could be expected to increase slightly, and there could be minor associated increases in local employment opportunities or community tax bases. Therefore, the effects of Phase 2 on local business would be beneficial under NEPA and Less than Significant under CEQA.

Action Alternatives Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.10-2: Change lifestyles and social interactions.

Alviso-Island Ponds, Alviso-Mountain View Ponds, Alviso-A8 Ponds, and Ravenswood Ponds—Alternative A (No Action)

Under Alternatives Island A, Mountain View A, A8 A, and Ravenswood A, no new activities would occur as part of Phase 2. These pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The local communities would experience no changes to their existing conditions. Therefore, no impacts to the current lifestyles and social interactions of the community would be expected.

No Action Alternatives Level of Significance: No Impact

Action Alternatives

The Action Alternatives for Phase 2 are Island B, Island C, Mountain View B, Mountain View C, A8 B, Ravenswood B, Ravenswood C, and Ravenswood D. These alternatives propose the construction of a range of new recreational and public access facilities at two of these pond clusters. The exceptions are the Alviso-Island pond cluster and the Alviso-A8 pond cluster, where no changes to public access are proposed and where the Phase 2 Action Alternatives (Alternatives Island B, Island C, and A8 B) would have no effect on the local communities. The proposed recreation and public access features in Phase 2 could have a small but beneficial effect on the lifestyles and social interactions of the communities surrounding the ponds. With more access to outdoor activities, the effects of this increase in opportunities for recreation would be beneficial.

Action Alternatives Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 2 Impact 3.10-3: Effects disproportionately placed on densely populated minority and low-income communities or effects on the ethnic or racial composition in a community.

Alviso-Island Ponds, Alviso-Mountain View Ponds, Alviso-A8 Ponds, and Ravenswood Ponds—Alternative A (No Action)

Under Alternatives Island A, Mountain View A, A8 A, and Ravenswood A, no new activities would occur as part of Phase 2. These pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The communities would remain similar to existing conditions.

Impacts related to flooding, as discussed in Section 3.2, Hydrology, would be Potentially Significant under the No Action Alternatives. Of the four pond clusters, the Alviso-Island pond cluster has both a minority and a low-income population and the Ravenswood pond cluster has a low-income population. Although there are minority and low-income populations in the areas around the Phase 2 pond clusters, not all areas impacted are classified as minority or low-income. Therefore, no disproportionate effects to minority or low-income communities would be expected.

No Action Alternatives Level of Significance: No Disproportionate Effect (NEPA only)

Action Alternatives

The Action Alternatives for Phase 2 are Alternatives Island B, Island C, Mountain View B, Mountain View C, A8 B, Ravenswood B, Ravenswood C, and Ravenswood D. These alternatives propose the construction of a range of new recreational and public access facilities at two of the pond clusters. These actions would involve earthmoving activities at each pond cluster that may cause short-term construction disturbance impacts (e.g., noise from construction equipment, increase in dust and truck traffic). These actions would also occur at some distance from residents and be similarly experienced by non-residents in the business parks and on public roads and trails. Users of these facilities are drawn from the general population. Activities would also not occur exclusively in areas where the minority population is a greater percentage than that of the surrounding cities' populations.

Construction activities would be temporary in nature for all four pond clusters. Due to the temporary nature of construction activities in the pond clusters and because these activities are not occurring in exclusively minority and low-income areas, the action alternatives would not disproportionately affect minority or low-income communities.

Action Alternatives Level of Significance: No Disproportionate Effect (NEPA)

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.10-5. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP and other Refuge management documents and practices. The socioeconomics and environmental justice analysis required no project-level mitigation measures to reduce the impacts to a level that was Less than Significant.

Table 3.10-5 Phase 2 Summary of Impacts: Socioeconomics and Environmental Justice

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.10-1: Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.	NI	LTS/ B	LTS/ B	NI	LTS/ B	LTS/ B	NI	LTS/ B	NI	LTS/ B	LTS/ B	LTS/ B
Phase 2 Impact 3.10-2: Change lifestyles and social interactions.	NI	LTS/ B	LTS/ B	NI	LTS/ B	LTS/ B	NI	LTS/ B	NI	LTS/ B	LTS/ B	LTS/ B
Phase 2 Impact 3.10-3: Effects disproportionately placed on densely populated minority and low-income communities or effects or racial composition in a community.	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE

Notes:

Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).

B = Beneficial (NEPA only)
LTS = Less than Significant
NDE = No Disproportionate Effect
NI = No Impact

3.11 Traffic

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing regional transportation network within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on transportation resources. The information presented is based on a review of the existing regional transportation network within the area and other pertinent federal, state and local regulations, which are presented in the regulatory framework setting section. Using this information as context, an analysis of transportation-related environmental impacts of the project is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only includes additional, project-level mitigation measures as needed.

3.11.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond Restoration EIS/R (2007 EIS/R) for the SBSP Restoration Project. The project traffic impact analysis is based on the traffic volumes identified by the California Department of Transportation (Caltrans) and local jurisdictions. Construction period project traffic impact analysis is based on the traffic volumes and significance criteria identified in the *Traffic Impact Study for South Bay Salt Pond Restoration - Phase 2 Project* (URS 2014), which is presented as Appendix G to this Final EIS/R.

Regional Setting

The area of Phase 2 of the SBSP Restoration Project consists of ponds on the southern shores of San Francisco Bay in the vicinity of Fremont in Alameda County, in the vicinity of San Jose and Mountain View in Santa Clara County, and in the vicinity of Menlo Park in San Mateo County (Figure 3.11-1). The transportation network in and around the southern end of San Francisco Bay consists of highways, surface streets, bicycle routes, public transit, railways, and air transportation facilities.

Highways

The major north-south trending highways in the South Bay include U.S. Highway 101 (U.S. 101), Interstate (I-) 280, I-680, and I-880, as described below.

- **U.S. 101** extends south from Washington, Oregon, and Northern California through the San Francisco Bay Area and further south to Los Angeles. U.S. 101 is located on the western side of San Francisco Bay, immediately west of the Ravenswood and Alviso-Mountain View pond clusters, and extends through the cities of Redwood City, Menlo Park, Palo Alto, Mountain View, Sunnyvale, and San Jose, among many others.
- **I-280** originates in San Francisco and extends south through the city of San Jose, where it connects to I-680. I-280 is located on the western side of San Francisco Bay, west of the Phase 2 project area. The highway and travels through the cities of Menlo Park, Palo Alto, and Los Altos, among many others.

- **I-680** originates in the North Bay, north of the city of Vallejo, and extends south until it connects with I-280 in San Jose. I-680 is located on the eastern side of San Francisco Bay, east of the , Phase 2 project area, and travels through the cities of Fremont and Milpitas, among many others.
- **I-880** extends along the eastern side of the Bay and connects I-80 in Oakland to State Route (SR) 17 in San Jose. I-880 is located east of the Alviso-Island Ponds, which are in the Phase 2 area of the SBSP Restoration Project, and travels through the cities of Fremont and Milpitas, among many others.

The major east-west trending highways in the South Bay include State Route (SR) 84 and SR 237, as described below.

- **SR 84**, which originates in the East Bay and crosses the San Francisco Bay via the Dumbarton Bridge, is located directly south of the Ravenswood pond cluster (also referred to as the Ravenswood Ponds) in the Phase 2 area of the SBSP Restoration Project.
- **SR 237**, which originates from I-680 in Milpitas and extends south of San Francisco Bay until it connects with SR 85 in Sunnyvale, is immediately south of the Alviso-A8 Ponds (also referred to as the A8 Ponds) in the Phase 2 area of the SBSP Restoration Project.

Streets and Bicycle Routes

Within each individual jurisdiction in Phase 2, the street network consists of arterial streets, collector streets, and local streets. Typically, arterial streets are high-capacity roads that accommodate through traffic between highways and urban centers. Collector streets supplement the arterial streets and provide access within residential neighborhoods and commercial and industrial areas. Local streets offer the lowest level of mobility and primarily provide access to bordering properties. Local streets are designed such that ease of access, pedestrian safety, and parking have priority over traffic movement. The street network in the vicinity of the project area is shown on Figure 3.11-1.

Many designated trails and bicycle routes are present nearby or adjacent to the project area. Bicycle routes are classified as separated off-street paths for the exclusive use of bicycles and pedestrians (Class I), striped bike lanes on a street or highway (Class II), or designated signed routes without a marked lane operating in mixed flow with motor vehicles (Class III). Bicycles may also operate legally on any roadway, regardless of whether a bike route class designation exists. Trails include the Bay Trail, which travels the entire perimeter of the San Francisco Bay; and trails at Bedwell Bayfront Park, Mountain View Shoreline Park, Sunnyvale Baylands Park, and Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). See Section 3.6, Recreation for more detailed information.

Public Transit

The public transit network in the region consists of rail and bus systems. Bay Area Rapid Transit (BART) provides service to the East Bay city of Fremont, east of the Alviso-Island Ponds. BART does not currently provide service to the area of Phase 2 in the South Bay or San Francisco Peninsula; however, a BART extension from Fremont to San Jose has been approved. The Union Pacific Railroad (UPRR) network extends through the region on both sides of the Bay and provides both freight and passenger service. Amtrak's Capitol Corridor route provides intercity rail passenger service between Sacramento and San Jose. Caltrain provides commuter rail service between San Francisco and San Jose.

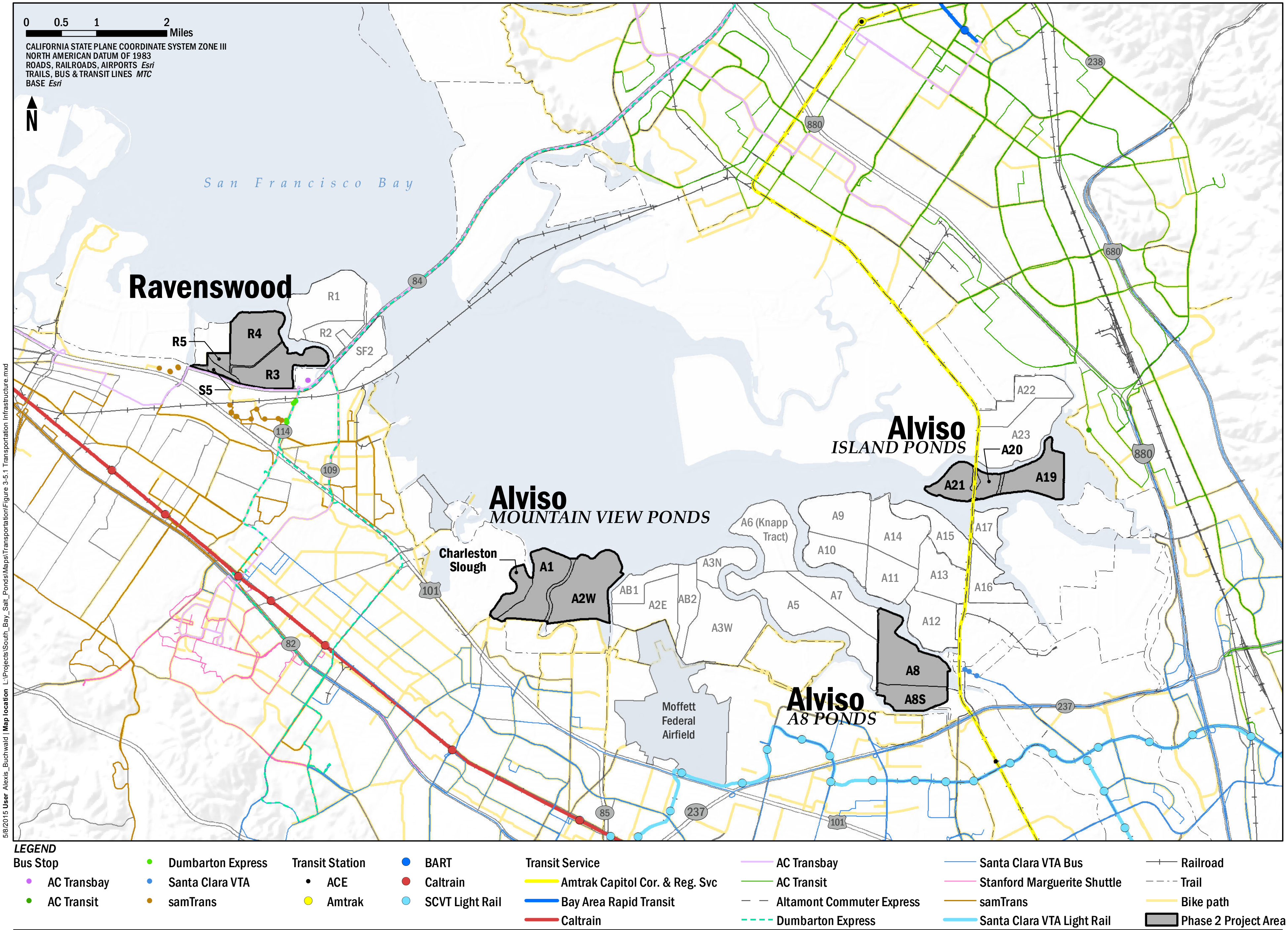

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Figure 3.11-1
Transportation Network

Santa Clara Valley Transportation Authority (VTA) operates buses and light rail that serve the urbanized portions of Santa Clara County. Alameda-Contra Costa Transit District (AC Transit) provides service throughout the East Bay as well as express service across the Dumbarton Bridge and Bay Bridge to San Francisco. San Mateo County Transit District (SamTrans) provides bus service throughout San Mateo County and into parts of San Francisco and Palo Alto. Caltrain provides shuttle service between Caltrain stations and various locations in the South Bay.

Water Transportation

San Francisco Bay is a major navigational and recreational waterbody that connects the Phase 2 ponds via watercraft. Currently, there are no public ferry routes in the South San Francisco Bay. A new ferry route is proposed between San Francisco and Redwood City; however, the project is currently in preliminary stages and is not considered a high priority for the Water Emergency Transportation Authority (City of Redwood City 2013).

Public Parking Facilities

As described in the 2007 EIS/R, public parking is available near the publicly accessible portions of the project area. Table 3.11-1 presents an inventory of the off-street parking, including handicapped parking.

Table 3.11-1 Off-Street Parking near the Phase 2 Areas of the SBSP Restoration Project

LOCATION*	NUMBER OF SPACES	OWNER
Bedwell Bayfront Park	30 (4h)	City of Menlo Park
Dumbarton Bridge, western approach, north side	Approx. 35 (2h)	Caltrans
Dumbarton Bridge, western approach, south side	Approx. 35 (2h)	Caltrans
Mountain View Shoreline Park	166 (4h)	City of Mountain View
Shoreline Amphitheater Overflow	> 200	City of Mountain View
Sunnyvale Water Pollution Control Plant, Carl Road	Approx. 15	City of Sunnyvale
Sunnyvale Baylands Park	> 200	City of Sunnyvale
Alviso Marina County Park	107 (at least 2h)	Santa Clara County Parks and Recreation
Refuge Environmental Education Center	42 (4h)	United States Fish and Wildlife Service (USFWS)

Notes: h = handicapped parking spaces; > = greater than

*There is no land-based public access to the Alviso-Island Ponds; therefore, there are no parking facilities.

Project Setting

Alviso – Island Ponds

The Alviso-Island Ponds, also referred to as the Island Ponds (Ponds A19, A20, and A21), are located between Coyote Creek and Mud Slough near the eastern end of the Alviso pond complex, in the city of Fremont. Interstate 880 is located approximately 1 mile to the east of the Island Ponds. According to the

Caltrans Traffic Data Branch, traffic volumes in 2013 for I-880 between SR 262 and Dixon Landing Road were 15,600 peak hour trips (Caltrans 2014).

The northeastern tip of Pond A19 has very limited service access via a service road along the eastern edge of the levee on Pond A23, from Landing Road via Fremont Boulevard or Warren Avenue. Fremont Boulevard and Warren Avenue are accessed from I-880. There is no public access to the Island Ponds beyond this point, and there is no public transit to the Island Ponds. AC Transit bus route 215 travels along Fremont Boulevard, the closest roadway to the Island Ponds (AC Transit 2012). The Fremont BART station is approximately 6 miles to the northeast, and the UPRR crosses the Island Ponds between Ponds A20 and A21 past the historic town of Drawbridge, but does not provide direct access to Refuge lands.

The closest airport to the Island Ponds is San Jose International Airport located approximately 6 miles to the southwest.

Alviso – Mountain View Ponds

The Alviso – Mountain View pond cluster (Ponds A1 and A2W and Charleston Slough) are on the western edge of the Alviso pond complex. The City of Mountain View lies immediately to the south, and the Palo Alto Flood Control Basin lie to the west. U.S. 101 is approximately 0.5 miles southwest of the Mountain View Ponds. In 2013, traffic volumes for U.S. 101 between Embarcadero Road/Oregon Expressway and San Antonio Road were 16,600 peak hour trips (Caltrans 2014).

There is no public vehicle access at Ponds A1 and A2W. Levee roads at the perimeter of the ponds are accessible by USFWS service vehicles for operations and maintenance activities on the levees and by Pacific Gas and Electric Company (PG&E) for its access to the power lines and towers in and around Pond A2W. Bicycle and pedestrian access to the southern perimeter of Ponds A1 and A2W is available from public trails (including the Bay Trail) at Mountain View Shoreline Park, accessed either from San Antonio Road or Shoreline Boulevard from U.S. 101.

There is no public transit directly to the Mountain View Ponds; however, VTA bus routes 40 and 120 travel along Charleston Road at the southernmost extent of Mountain View Shoreline Park (VTA 2013).

The closest airport to the Mountain View Ponds is San Jose International Airport located approximately 10 miles to the southeast.

Alviso – A8 Ponds

The A8 Ponds (Ponds A8 and A8S) are located in the southern central portion of the Alviso pond complex. They are west of the community of Alviso and north of Sunnyvale. SR 237 is approximately 0.5 mile south of Pond A8S. In 2013, traffic volumes for SR 237 between North First Street and Great America Parkway were 11,000 peak hour trips (Caltrans 2014).

Vehicle access to the western and southern perimeter of the A8 Ponds is available from an access road via Gold Street, though there are no public parking facilities or recreation-based amenities there. Gold Street is accessed from Great America Parkway from SR 237. There is no public vehicle access allowed along the levees surrounding these ponds. Bicycle and pedestrian access to trails near the south perimeter of the A8 Ponds (including parts of the Bay Trail) is available from Sunnyvale Baylands Community Park via East Caribbean Drive.

Several VTA bus routes travel near the A8 Ponds. Routes 120, 122, 321, and 328 travel along East Caribbean Drive, and Route 58 travels to the town of Alviso. In addition, there are two VTA light rail stations – Crossman Station and Borregas Station – less than 1.5 miles southwest of the ponds (VTA 2013).

The closest airport to the A8 Ponds is San Jose International Airport, which is located approximately 12 miles to the south.

Ravenswood Ponds

The Ravenswood Ponds (Ponds R3, R4, R5 and S5) are on the Peninsula side of the Bay, west of the Dumbarton Bridge, and adjacent to the City of Menlo Park in San Mateo County. Bedwell Bayfront Park in Menlo Park is directly west of the Ravenswood Ponds, and a portion of SR 84 is along its southern border. U.S. 101 is approximately 0.5 miles southwest of the Ravenswood Ponds. In 2013, the traffic volume for SR 84 between University Avenue (SR 109) and Willow Road (SR 114) was 56,000 peak hour trips. The traffic volume for U.S. 101 between Willow Road (SR 114) and Marsh Road (SR 84 junction) was 15,600 peak hour trips (Caltrans 2014).

There is no public vehicle access at the Ravenswood Ponds, and there are no public trails within the Refuge itself. However, bicycle and pedestrian access to the western perimeter of the Ravenswood Ponds is available from public trails at the adjacent Bedwell Bayfront Park, and to the southern perimeter from the Bay Trail. Both the Bay Trail and Bedwell Bayfront Park are accessible from U.S. 101 and SR 84 via Marsh Road. Levee roads around the ponds themselves are accessible only to service vehicles for operations and maintenance activities.

There is limited public transit to the Ravenswood Ponds. The Caltrain Marsh Road shuttle travels from the Menlo Park Caltrain Station to the intersection of SR 84 and Marsh Road (Caltrain 2013). The Dumbarton Express, run by a consortium of transit agencies and administered by AC Transit, runs in both directions across the Dumbarton Bridge and passes just south of the Ravenswood Ponds on SR 84. The Menlo Park Caltrain Station is approximately 2 miles to the southwest.

The closest airport to the Ravenswood Ponds is the San Francisco International Airport, which is located approximately 21 miles to the northwest.

3.11.2 Regulatory Setting

State, regional, and local agencies have jurisdiction over the transportation network and over circulation in and around the project area. Caltrans has authority over the state highway system, including mainline facilities and interchanges. Caltrans is responsible for the planning, design, and construction of highway improvements, as well as for operations and maintenance.

San Mateo County Transportation Authority (SMCTA), VTA, and Alameda County Transportation Commission (Alameda CTC) are responsible for county-wide transportation planning. This includes highway and roadway improvements and the operation of public transit systems, shuttles, and carpool, bicycling and pedestrian programs. In addition, these agencies are responsible for long-range regional transportation planning in coordination with the Metropolitan Transportation Commission (MTC).

San Mateo County, Santa Clara County, and Alameda County are responsible for the maintenance of roadways in unincorporated areas of the counties as well as for coordination with SMCTA, VTA, and Alameda CTC, respectively, for regional transportation planning projects.

Individual cities and towns in the project area have jurisdiction over their respective city streets, bike paths, public trails, and parking facilities.

Several counties and cities near the pond clusters have adopted General Plans that include strategies and policies regarding the operation of the transportation network. The General Plans and applicable goals and policies are included below.

Santa Clara County

The Santa Clara County General Plan (1994) identifies four strategies to improve the adequacy of the overall transportation system. The four strategies are: 1) Develop Urban Land Use Patterns that Support Travel Alternatives; 2) Manage Travel Demand, System Efficiency, and Congestion; 3) Expand System Capacity and Improve System Integration; and 4) Support New Transportation Technologies. The plan includes the following goals that are relevant to Phase 2 of the SBSP Restoration Project:

- **Policy C-TR 12:** It is the goal of this plan to achieve a level-of-service (LOS) no lower than D at peak travel periods on city streets, county roads, expressways and state highways. However, in certain instances, a lower level-of-service may be acceptable when LOS D cannot practically be achieved.
- **Policy C-TR 34:** Bicycling and walking should be encouraged and facilitated as energy conserving, non-polluting alternatives to automobile travel.
- **Policy C-TR 35:** A bicycle transit system should be provided that is safe and convenient for the user and which will provide for the travel needs of bicyclists.

San Mateo County

The San Mateo County General Plan (1986) includes the following transportation goals and objectives that are relevant to the SBSP Restoration Project, Phase 2:

- **12.18 Recreational Traffic to the Coastside:** Seek methods to mitigate the impact of peak recreational traffic to and along the Coastside.
- **12.19 Circulation East of Highway 101:** Encourage the cities and CalTrans to develop an adequate circulation system, including bikeways, and other context-sensitive design features to serve all transportation users and new development east of Highway 101 and which, to the maximum extent feasible, does not adversely affect baylands or wetlands.
- **12.21 Local Circulation Policies:** In unincorporated communities, plan for providing: routes for truck traffic that avoid residential areas and are structurally designed to accommodate trucks.

Fremont

The City of Fremont General Plan (2011) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **Policy 3-3.4 Transportation Systems Management:** Implement transportation systems management measures to reduce peak hour congestion and make the most efficient use of the city's transportation infrastructure.
- **Policy 3-3.5 Transportation Infrastructure Maintenance:** Provide adequate funding to maintain roads, bridges, sidewalks, bike paths, and other transportation facilities in good operating condition.
- **Policy 3-4.1 Relating Vehicle Speed to Reflect Land Use and Community Character:** Manage traffic on arterials and collectors to reduce unnecessary travel delays and maintain efficient vehicle flow. However, auto speed and convenience may be diminished in some locations in order to achieve a more livable, walkable, and attractive community. In general, lower vehicle speeds will be encouraged in pedestrian-oriented areas such as the Town Centers and city center. Roadway design and operation in these areas should emphasize community character, access to adjacent commercial and mixed land uses, and the accommodation of multiple travel modes, rather than vehicle speed.
- **Policy 3-4.4 Mitigating Development Impacts:** Require new development to mitigate its impacts on mobility conditions through traffic impact fees, street and intersection improvements, transportation demand management programs, and other measures.
- **Policy 3-5.2 Regional Trail Development:** Promote and coordinate the planning of pedestrian and bicycle trail systems with Alameda County, Newark, Milpitas, Union City, Santa Clara County, Association of Bay Area Governments, Bay Conservation and Development Commission, East Bay Regional Parks District, San Francisco Public Utilities Commission, Alameda County Flood Control, and other jurisdictions and organizations.
- **Policy 3-6.2 Truck Routes:** Protect residential neighborhoods from intrusion by truck traffic by maintaining and enforcing an efficient system of designated truck routes.
- **Policy 3-7.1 Parking Management:** Manage on-street parking to ensure the efficient use of curbside space, avoid conflicts with residents and neighborhoods, and provide adequate customer parking for local businesses.

San Jose

The City of San Jose General Plan (2011) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **Policy TR-1.2:** Consider impacts on overall mobility and all travel modes when evaluating transportation impacts of new developments or infrastructure projects.
- **Policy TR-1.8:** Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with complementary land uses that encourage travel by bicycling, walking, and transit, and ensure that regional greenhouse gas emission standards are met.
- **Policy TR-5.3:** The minimum overall roadway performance during peak travel periods should be level of service "D" except for designated areas.

- **Policy TR-5.4:** Maintain and enhance the interconnected network of streets and short blocks that support all modes of travel, provide direct access, calm neighborhood traffic, reduce vehicle speeds, and enhance safety.
- **Policy TR-6.1:** Minimize potential conflicts between trucks and pedestrian, bicycle, transit, and vehicle access and circulation on streets with truck travel.
- **Policy TR-6.3:** Encourage through truck traffic to use freeways, highways, and County Expressway and encourage trucks having an origin or destination in San José to use Primary Truck Routes.
- **Policy TR-8.9:** Consider adjacent on-street and City-owned off-street parking spaces in assessing need for additional parking required for a given land use or new development.
- **Policy TN-2.2:** Provide direct, safe and convenient bicycle and pedestrian connections between the trail system and adjacent neighborhoods, schools, employment areas and shopping areas.

Sunnyvale

The City of Sunnyvale General Plan (2011) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **Policy LT-5.1:** Achieve an operating Level-of-Service (LOS) of "D" or better on the city-wide roadways and intersections, as defined by the functional classification of the street system.
- **Policy LT-5.4:** Maintain roadways and traffic control devices in good operating condition.
- **Policy LT-5.5:** Support a variety of transportation modes.
- **Policy LT-5.8:** Provide a safe and comfortable system of pedestrian and bicycle pathways.

City of Santa Clara

The City of Santa Clara General Plan (2010) includes the following transportation goals and policies that are relevant to the SBSP Restoration Project, Phase 2:

- **5.8.7-P6:** Discourage through truck and freight traffic on local and collector streets, except for deliveries to destinations only accessible from those streets.

Mountain View

The City of Mountain View General Plan (2012) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **MOB 4.1:** Bicycle network. Improve facilities and eliminate gaps along the bicycle network to connect destinations across the city.
- **MOB 7.2:** Off-street parking. Ensure new off-street parking is properly designed and efficiently used.
- **MOB 7.3:** Public parking management. Manage parking so that adequate parking is available for surrounding uses.

- **MOB 10.1:** Efficient automobile infrastructure. Strive to maximize the efficiency of existing automobile infrastructure and manage major streets to discourage cut-through traffic on neighborhood streets.
- **MOB 11.3:** Facility Types. Maintain and enhance walking, bicycling and transit-related facilities to address community needs.

Palo Alto

The City of Palo Alto General Plan (2007) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **POLICY T-29:** Regulate truck movements in a manner that balances the efficient movement of goods with the residential character of Palo Alto's arterial street system.

Menlo Park

The City of Menlo Park General Plan (1994; amended 2013) includes the following policies that are relevant to the SBSP Restoration Project, Phase 2:

- **Policy II-A-1**: Level of Service D (40 seconds average stopped delay per vehicle) or better shall be maintained at all city-controlled signalized intersections during peak hours, except at the intersection of Ravenswood Avenue and Middlefield Road and at intersections along Willow Road from Middlefield Road to U.S. 101.

3.11.3 Environmental Impacts and Mitigation Measures

Overview

This section includes an analysis of potential short-term (construction) and long-term (operation) traffic impacts of the SBSP Restoration Project, Phase 2. Impact evaluations for the action alternatives are assessed based on the existing conditions described in Section 3.11.2 above; they are not assessed based on the proposed conditions that would occur under the No Action Alternative. This approach mimics what was done for the 2007 EIS/R. In this case, the No Action Alternative represents no change from the current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and in USFWS Refuge management guidance documents. In addition, mitigation measures are recommended, as necessary, to reduce significant traffic impacts.

The result of the analysis process was a set of alternatives, including the No Action Alternative, a NEPA term (also referred to as the "Project Alternative" under CEQA, but the NEPA term will be used throughout this Final EIS/R for each of the pond complexes.

Significance Criteria

For the purposes of the Final EIS/R, a significant traffic impact would occur if the project would result in the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, and including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

- Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Phase 2 of the SBSP Restoration Project would not result in an increase in air traffic or require a change to existing air traffic patterns. The project would not increase hazards due to design features or incompatible uses, as the project would involve only restoration of tidal marsh wetlands or other habitat improvements and inclusion of recreational facilities within open space areas away from public roads. Recreational facilities proposed along levees within the boundaries of the SBSP Restoration Project would be designed in accordance with relevant guidelines and regulations, and would not constitute a hazard for those who use the facilities. The project would not result in inadequate access to local streets, including for emergency access, as road closures are not expected during construction or operation. The project would not result in lengthy delays for transit riders and would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or decrease the performance or safety of such facilities.

As explained in Section 3.1.2, while both Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) and the CEQA Guidelines (AEP 2014) were considered during the impact analysis, impacts identified in this Final EIS/R are generally characterized using California Environmental Quality Act (CEQA) terminology; NEPA terms are used for potentially beneficial impacts, if any. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Approach to Analysis

Construction

Construction activities under Phase 2 of the SBSP Restoration Project would include the transport of equipment, material, and workers to and from the Phase 2 pond clusters.

Access routes to the Phase 2 area would include the major highways surrounding the pond clusters and local roadways. Specifically, access routes to the pond clusters are as follows:

- **Island Ponds:** The primary access route would be from the adjacent levees at Ponds A22 and A23. Vehicle and heavy equipment access to these ponds is available from levee roads as shown on Figure 2-6 in Chapter 2. An amphibious excavator would then be offloaded and floated across

Mud Slough. Secondary access for construction crews on very light vehicles is available through the city of Fremont. From I-880, the route is from the Fremont Boulevard exit extending west on Landing Road, which includes the intersections of I-880 off- and on-ramps with Fremont Boulevard and the intersection of Fremont Boulevard and Cushing Parkway in Fremont.

- **Mountain View Ponds:** The primary access route is U.S. 101 to the San Antonio Road exit and north on San Antonio Road, which includes the intersections of U.S. 101 NB off- and on-ramps/San Antonio Road and Bay Shore Parkway/San Antonio Road in the City of Mountain View. The secondary access route is U.S. 101 to the Shoreline Boulevard exit and north on Shoreline Boulevard, which includes the intersections of U.S. 101 off- and on-ramps/Shoreline Boulevard in the city of Mountain View. (Figure 2-10) These routes can each support a total of 200 delivery trips per day, but would not be used in conjunction with one another.
- **A8 Ponds:** The primary access route is SR 237 to the Great America Parkway exit, and northwest on Gold Street, which includes the intersections of SR 237 off- and on-ramps/Great America Parkway and Bay Shore Parkway/San Antonio Road in the City of Santa Clara and the intersections of Gold Street Connector/Great America Parkway and Gold Street Connector/Lafayette Street in San Jose. (Figure 2-13) This route can support a total of 180 delivery trips per day.
- **Ravenswood Ponds:** The primary access route is SR 84 to the Marsh Road exit to a road in Bedwell Bayfront Park north of Pond S5, which includes the intersections of U.S. 101 off- and on-ramps/Marsh Road and SR 84/Marsh Road in Menlo Park. (Figure 2-18) This route can support a total of 150 delivery trips per day.

Staging areas would be established for equipment and material storage for three of the Phase 2 pond clusters. It is unlikely any staging area would be needed for work at the Island Ponds. Plans for staging areas at the other three pond clusters are as follows:

- **Mountain View Ponds:** The City of Mountain View has designated areas in Shoreline Park for material staging and stockpiling (Figure 2-10).
- **A8 Ponds:** The landfill access road adjacent to the southern end of Pond A8S has room for temporary storage of upland fill material, if such storage is necessary for placement in the pond.
- **Ravenswood Ponds:** Staging will either be on one of the wider levees within the Refuge's boundaries or within Bedwell Bayfront Park, by agreement with the City of Menlo Park.

Construction-related traffic estimates are provided below. The alternatives for each pond cluster differ with respect to the duration (or months[1] required) for net importing of fill based on the volumes required for construction activities, as shown in Table 3.11-2:

1 For this analysis, a typical month has 22 work days.

Table 3.11-2 Pond Alternatives Earthwork Volumes and Fill Delivery Duration

ALTERNATIVE	ESTIMATED EARTHWORK VOLUME (CY)			MAX TRIPS PER DAY	DURATION (MONTHS REQUIRED)
	CUT	FILL	NET IMPORT		
Island B	109,600	–	–	n/a	n/a
Island C	202,600	–	–	n/a	n/a
Mountain View B	20,400	316,800	296,400	200	6.1
Mountain View C	51,400	421,000	369,600	200	7.6
A8 B	--	190,000	190,000	180	4.4
Ravenswood B	39,700	77,600	37,900	150	1.0
Ravenswood C	45,400	255,800	210,400	150	5.8
Ravenswood D	87,900*	73,000	–	n/a	n/a*

*Cut volumes for Ravenswood D would be 56,700 cubic yards (cy), but the City of Redwood City's associated Bayfront Canal and Atherton Channel actions would generate a surplus of 31,200 cubic yards (cy) that would be available for use in the Ravenswood Ponds; this creates a surplus of material of almost 15,000 cy that could be used on site for other levee enhancements or restoration features.

- **Island Ponds:**
  - Work crew transport: three to five people per day;
  - Equipment transport: once per season;
  - No fill material is required for Alternative Island B or Alternative Island C.
- **Mountain View Ponds:**
  - Work crew transport: 5 to 10 people per day
  - Equipment transport: once per season
  - Fill material delivery for Alternative Mountain View B would require 200 trips per day, for a total duration of 6.1 months.
  - Fill material delivery for Alternative Mountain View C would require 200 trips per day, for a total duration of 7.6 months (over two construction seasons).
- **Alviso – A8 Ponds:**
  - Work crew transport: three to five people per day.
  - Equipment transport: once per season.
  - Fill material delivery for Alternative A8 B would require 180 trips per day, for a total duration of 4.4 months.
- **Ravenswood Ponds:**
  - Work crew transport: 5 to 10 people per day.
  - Equipment transport: once per season.

- Fill material delivery for Alternative Ravenswood B would require 200 trips per day, for a total duration of 1.0 months.
- Fill material delivery for Alternative Ravenswood C would require 200 trips per day, for a total duration of 5.8 months.
- Fill material delivery for Alternative Ravenswood D would not be required due to a surplus of material of almost 15,000 that could be used on site for other levee enhancements or restoration features.

Intersection Evaluation

This section summarizes the methodologies used to perform peak hour intersection capacity analysis at signalized intersections. In accordance with CEQA requirements, an EIR must include a description of the existing physical environmental conditions in the vicinity of the project. Those conditions, in turn, “will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant” (CEQA Guidelines §15125[a]). Level-of-service analysis was conducted based on the traffic data collected by URS and by utilizing the Synchro 9.0 software package, and based on the methodologies outlined in the Highway Capacity Manual (Transportation Research Board 2000).

The resulting LOS and delays were compared for the existing and project conditions. LOS, which measures traffic operating conditions, varies from LOS A to LOS F. Table 3.11-3 presents a description of LOS and provides the associated delays with each LOS for signalized intersections.

Table 3.11-3 Level of Service and Average Vehicular Delay Definitions for Signalized Intersections

LOS	AVERAGE VEHICULAR DELAY (SECONDS)	DEFINITION
A	< 10	Very low control delay. Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all.
B	> 10 and < 20	Occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A.
C	> 20 and < 35	Occurs when a given green phase does not serve queued vehicles and overflow occurs. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35 and < 55	The influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55 and < 80	High delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity (v/c) ratios. Individual cycle failures are frequent.
F	> 80	Oversaturation of the intersection often occurs. Arrival flow rates exceed the capacity of the lane groups. Also, high v/c ratios occur with many individual cycle failures.

Source: Highway Capacity Manual (Transportation Research Board 2000)
v/c ratio = volume-to-capacity ratio

Operation

Operation and maintenance activities for the pond clusters in the Refuge would continue to follow and be dictated by the 2009 USACE permit #2008-00103S, applicable County operations, and the AMP.

The long-term operation and maintenance of the alternatives would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Operation of the water control structures could be more variable in terms of the number of staff visits. In addition, AMP monitoring activities would occur, which could require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). For the purposes of analysis, it is estimated that 10 one-way trips associated with AMP monitoring activities would occur per week.

Implementation of Alternatives Mountain View B and C, and Ravenswood B, C, and D are expected to result in an increase in vehicle trips associated with visitors of the new recreational facilities in the pond clusters. Section 3.6, Recreation, and its associated Appendix F explain the method and data used to develop estimates for the numbers of increased recreational visitors to these two pond clusters.

Program-Level Evaluation Summary

The Programmatic EIS/R evaluated the potential impacts to the transportation network, including nearby roadways, as a result of three programmatic alternatives. The Programmatic EIS/R found that with the implementation of Programmatic Alternative C, the preferred alternative, there would be less-than-significant impacts to long-term operations-related traffic, and potentially significant impacts associated with short-term construction-related traffic, construction-related wear and tear to haul routes, and parking capacity at regional facilities. Mitigation measures were developed to reduce these impacts to a less-than-significant level. These mitigation measures have been incorporated into the design of each action alternative and are summarized below:

- Recreation facilities will be designed with sufficient parking spaces to accommodate the projected increase in vehicles that access the site unless adequate off-site parking is available to offset the demand for parking spaces.

- If residential streets are included as part of the designated haul routes, videos of the pre-construction and post-construction roadways will be prepared for the purposes of comparison. Prior to construction, the pre-construction conditions and post-construction requirements of the roadway rehabilitation program will be documented. No residential streets are planned for construction-related use during these Phase 2 actions.

Mitigation measure **SBSP Mitigation Measure 3.12-1: Timing of construction-related truck trips** was also included in the Programmatic EIS/R. This mitigation measure required the landowner (USFWS) to include in construction plans and specifications the requirement that construction-related truck trips, specifically deliveries of fill and equipment, shall occur outside the weekday a.m. and p.m. peak commute traffic hours. This mitigation measure is not feasible to implement in the Phase 2 actions because of the large amount of upland material that needs to be imported by truck to three of the pond clusters in relatively condensed periods of time.

Finding source projects with sufficient quantities of upland fill material is difficult for several reasons. The excavation must occur in a year and season when the SBSP Restoration Project can accept it. Stockpiling material or moving it more than once is prohibitive and would increase environmental impacts. In addition, to be used in a restoration project, the material must pass a screening to demonstrate its lack of contamination. The source project should also be located close enough to the restoration project that bringing it to the project's location would both have fewer environmental impacts and be less expensive than bringing to a landfill or other destination. The number of suitable source projects is likely to be limited by the difficulty of successfully meeting all these criteria. It would not therefore be feasible to further constrain the source projects and dirt brokers/haulers by limiting the hours of material delivery to the non-peak commute periods. Assuming these entities would be willing to comply, their own costs would increase, and they would pass that on to the SBSP Restoration Project, raising associated costs by an estimated 30 percent at a minimum. Collectively, these barriers make the implementation of the restricted hours under **SBSP MM 3.12-1** infeasible.

For these reasons, the analysis for Chapter 3.11 will not uniformly be implementing this mitigation measure and instead conducted a full analysis of the number of truck trips and the impacts associated with them within the *Traffic Impact Study for South Bay Salt Ponds Restoration - Phase 2 Project* (URS 2014).

Project-Level Evaluation

Phase 2 Impact 3.11-1: Potential short-term degradation of traffic operations at intersections and streets due to construction

The *Traffic Impact Study for South Bay Salt Ponds Restoration - Phase 2 Project* (URS 2014) was prepared to analyze the impact of construction-related traffic on each of the project alternatives. The most intensive construction activity in terms of added traffic would result from the delivery of fill material for the construction of levees and transition zone habitat. Specific quantities (cubic yards) are provided in Table 3.11-2. Therefore, the analysis performed focuses on the hourly trips required to deliver the required materials in the shortest time and number of days possible. Construction routes were analyzed to determine the maximum amount of trucks that could feasibly deliver fill within a single 10-hour work day, and therefore the analysis may use a different number of maximum trips per hour for each pond cluster. For the traffic analysis, it was assumed that the Mountain View Action Alternatives would have 20 Peak Hour truck trips, the A8 Action Alternatives would have 18 peak hour truck trips, and the Ravenswood Action Alternatives would have 15 peak hour truck trips.

The traffic impact criteria used in evaluating traffic LOS for signalized intersections during the project construction phase are based on an increase in delay based on LOS, as follows:

- An impact is considered to be significant if the addition of project construction-related traffic results in a reduction in LOS below LOS D.
- For intersections that are projected to operate at LOS E or F under baseline conditions, an impact is considered to be significant if the addition of project-related traffic increases average delay at an intersection by 4 seconds or more within the city of Santa Clara and the city of Mountain View. Within the city of Menlo Park, for intersections that are projected to operate at LOS E or F under baseline conditions, an impact is considered to be significant if the addition of project-related traffic increases average delay at an intersection by 0.8 seconds or more (URS 2014).

Alviso – Island Ponds

Alternative Island A (No Action). Under this alternative, no construction activities would take place at the Alviso-Island Ponds as part of Phase 2. The pond cluster would continue to be monitored and managed through the activities described in the AMP; however, this would be considered part of project operation, not construction. As such, no construction-generated traffic would occur, and there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Implementation of this alternative would remove, breach, or lower the levees between Ponds A19 and A20. Construction activities would generate traffic associated with the transport of materials and equipment. A preliminary estimate shows that construction would likely be completed in approximately 16 months over two construction seasons. No material would need to be moved on or off site for the construction of this alternative. Thus, vehicle trips would only be required for workers commuting on a daily basis (three to five people). The transport of equipment at the beginning and end of construction seasons would occur by accessing the ponds on barges from the bay water side, either through Mud Slough or Coyote Creek. Therefore, temporary traffic increases associated with construction activities would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Implementation of this alternative would include all of the components of Alternative Island B as well as three additional components: levee breaches on the north sides of ponds A20 and A21, pilot channels in Pond A19, and widening of the existing breaches on the southern levee of Pond A19. Construction activities would generate traffic associated with the transport of materials and equipment. A preliminary estimate shows that construction would likely be completed in approximately 19 months over two or three construction seasons. No material would need to be moved off site for the construction of this alternative. Truck trips would be required for the transport of equipment at the beginning and end of construction, and for workers commuting on a daily basis (three to five people).

This alternative would generate construction crew trips over more months than Alternative Island B, but the daily increases would be similar. However, any increase would not noticeably contribute to local traffic delays, and therefore temporary traffic increases associated with the construction activities would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso – Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, no construction activities would be implemented as part of Phase 2. The pond cluster would continue to be managed through the activities described in the AMP; however, this would be considered part of project operation, not construction. As such, no construction-generated traffic would occur, and there would be no impact.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Implementation of this alternative would introduce tidal flows to Ponds A1 and A2W by breaching levees at several points. The west levee of Pond A1 would be raised. Habitat transition zones and islands would be constructed to increase habitat complexity and quality in the ponds for special-status species. A new trail, viewing platform, and interpretative platform would be installed to improve recreation and public access at these ponds. The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phase. Construction activities would generate traffic associated with the transport of materials and equipment and the delivery of fill material. The SBSP Restoration Project will develop the final haul routes in consultation with the City of Mountain View's traffic engineers to minimize potential traffic impacts. A preliminary estimate shows that construction would likely be completed in approximately 27 months over three construction seasons. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (5 to 10 people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; therefore, temporary traffic increases would be less than significant.

As discussed in Chapter 3.6, Recreation Resources, the Construction Contractor will be required as part of the Construction Bid Documents to provide alternative temporary parking areas and a temporary alternate route to access public facilities, wherever feasible.

In addition to the trips required for the transport of equipment at the beginning and end of construction and for the worker's daily commute, a maximum of 200 two-way truck trips per day for the duration of a minimum of 6.1 months will be required for the delivery of fill material needed to construct habitat transition zones and islands. The primary fill delivery route includes the intersections of U.S. 101 NB off- and on-ramps/San Antonio Road and Bayshore Parkway/San Antonio Road in the city of Mountain View. The secondary fill delivery route includes the intersection of U.S. 101 off- and on-ramps/Shoreline Boulevard in the city of Mountain View. Table 3.11-4 presents the results for the Action Alternative intersection analysis under Existing Plus Project conditions and compares these results with those under Existing conditions. As shown in the table, the intersections under the Mountain View Alternatives would not be impacted by project traffic. Therefore, project construction-related impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Table 3.11-4 LOS and Delay for Existing Conditions and Project Conditions

INTERSECTION	LOCATION (POND CLUSTER/CITY)	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT		
			DELAY[1] (SEC)	LOS	DELAY[1] (SEC)	LOS	Δ IN CRITICAL DELAY[2] (SEC)
U.S. 101 NB off-ramp/ Shoreline Boulevard	Mountain View/Mountain View	**AM**	**73.3**	**E**	**75.3**	**E**	**3.9**
		PM	54.0	D	54.0	D	0.0
U.S. 101 SB off-ramp/ Shoreline Boulevard	Mountain View/Mountain View	AM	19.6	B	19.7	B	0.1
		PM	16.6	B	16.8	B	0.2
U.S. 101 NB off-ramp/San Antonio Road	Mountain View/Mountain View	AM	10.6	B	10.7	B	0.1
		PM	10.8	B	10.9	B	0.1
SR 237 WB off-ramp/Great America Parkway	A8/Santa Clara	AM	14.6	B	15.0	B	0.4
		PM	9.8	A	9.9	A	0.1
SR 237 EB off-ramp/Great America Parkway	A8/Santa Clara	AM	11.6	A	11.8	B	0.2
		PM	18.7	B	19.5	B	0.8

Table 3.11-4 LOS and Delay for Existing Conditions and Project Conditions

INTERSECTION	LOCATION (POND CLUSTER/CITY)	PEAK HOUR	EXISTING DELAY[1] (SEC)	EXISTING LOS	EXISTING PLUS PROJECT DELAY[1] (SEC)	EXISTING PLUS PROJECT LOS	EXISTING PLUS PROJECT Δ IN CRITICAL DELAY[2] (SEC)
U.S. 101 NB off-ramp/Marsh Road (SR 84)	Ravenswood/ Menlo Park	AM	20.8	C	20.9	C	0.1
		PM	26.9	C	27.3	C	0.4
U.S. 101 SB off-ramp/Marsh Road (SR 84)	Ravenswood/ Menlo Park	**AM**	**55.8**	**E**	**57.0**	**E**	**2.9**[3]
		PM	44.4	D	45.8	D	1.4

Source: URS 2014
EB = eastbound; NB = northbound; SB = southbound; WB = westbound
Notes:
Bold indicates LOS worse than D.
Gray shading indicates an adversely impacted intersection.
1. Intersection Control Delay per HCM methodology
2. Change in critical movement delay between existing and project conditions.
3. Impact per City of Menlo Park criteria of 0.8-second delay increase.

Alternative Mountain View C. This alternative would breach levees and lower levee heights between A1 and Charleston Slough to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough. Other modifications include adding, raising, and improving the south and west levees around Charleston Slough and building habitat transition zones and islands, leaving open the possibility of future connectivity with two brackish marshes south (inland) of Pond A2W. Several new trails, viewing platforms, and interpretative platforms would be installed or replaced to improve recreation and public access at the pond cluster. The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phase. The SBSP Restoration Project will develop the final haul routes in consultation with the City of Mountain View's traffic engineers to minimize potential traffic impacts. Construction activities would generate traffic associated with the transport of materials and equipment and the delivery of fill material. A preliminary estimate shows that construction would likely be completed in approximately 35 months over five construction seasons. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (5 to 10 people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; therefore temporary traffic increases would be less than significant. Impacts to recreation access from construction activities are the same as discussed for Alternative Mountain View B.

Alternative Mountain View C would require a maximum of 200 daily truck trips, as is also required under Alternative Mountain View B, but for a minimum duration of 7.6 months. For the same reasons listed for Alternative Mountain View B, temporary traffic increases associated with the construction activities would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso – A8 Ponds

Alternative A8 A (No Action). Under this alternative, no construction activities would be implemented as part of Phase 2. The USFWS would continue to operate and maintain the ponds in accordance with the

AMP and other ongoing management practices. As such, no construction-generated traffic would occur, and there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Alternative A8 B is the only action alternative for this pond cluster. In this alternative, habitat transition zones would be constructed in the southwest and southeast corners of Pond A8S. The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phase. Construction activities would generate traffic associated with the transport of materials and equipment and the delivery of fill material. A preliminary estimate shows that construction would likely be completed in approximately 19 weeks over one construction season. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (three to five people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; therefore temporary traffic increases would be less than significant.

In addition to the trips required for the transport of equipment at the beginning and end of construction and for the worker’s daily commute, a maximum of 180 two-way truck trips per day for a minimum of 4.4 months will be required for the delivery of fill material needed to construct habitat transition zones. The primary fill delivery route includes the intersections of 237 WB off-ramp/Great America Parkway and SR 237 EB off-ramp/Great America Parkway in the city of Santa Clara. Table 3.11-4 presents the results for the Action Alternative intersection analysis under Existing Plus Project conditions and compares these results with those under Existing conditions. As shown in the table, the A8 Alternative intersections would not be impacted by project traffic; therefore project construction-related impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, no construction activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System and the AMP. The outboard levees along Ponds R4 and R3 provide inland flood protection and would continue to be maintained or repaired as a component of the 2009 USACE permit #2008-00103S. The adjacent Bedwell Bayfront Park, owned by the City of Menlo Park, has trails that would continue to be used and maintained separately. As such, no construction-generated traffic would occur, and there would be no impact.

Alternative Ravenswood A Level of Significance: No impact

Alternative Ravenswood B. Alternative Ravenswood B would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create a habitat transition zone along the western edge of R4, establish enhanced managed ponds in Ponds R5 and S5 to improve habitat for diving and dabbling birds, establish enhanced managed ponds in Pond R3 to improve habitat for western snowy plover, increase pond connectivity, and improve recreation and public access. The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phase. Construction activities would generate traffic associated with the transport of materials and equipment and the delivery of fill material. A preliminary estimate shows that construction would likely be completed in approximately 5 months over one construction season. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (5 to 10 people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; therefore temporary traffic increases would be less than significant.

Because the only land vehicle access to the Ravenswood Ponds is through the entrance to Bedwell Bayfront Park, any construction activities in these ponds would have some effect on recreational use of the park. During the start and end of a construction season, heavy construction equipment would be brought in and out of the Refuge through the park, which could lead to delays for park visitors. This could also occur during each day's commute as the work crews arrive. This daily commute would happen in smaller and faster passenger vehicles, and the work crews are typically small (approximately 10 people). Finally, the trucks that would deliver upland fill material to the ponds for use in levee raising or improvement or habitat transition zone construction would likely cause delays in the entry and exit from the park and parking lot by recreational park visitors. Note that the USFWS Refuge managers have an easement with the City of Menlo Park for entry and exit of operations and maintenance vehicles through the entry gate of Bedwell Bayfront Park and its roads.

In addition to the trips required for the transport of equipment at the beginning and end of construction and for the worker's daily commute, a maximum of 150 two-way truck trips per day for a duration of a minimum of 1 month will be required for the delivery of fill material needed to construct the habitat transition zone. The primary fill delivery route includes the intersections of U.S. 101 NB off-ramp/Marsh Road (SR 84) and U.S. 101 SB off-ramp/Marsh Road (SR 84) in the city of Menlo Park. Table 3.11-4 presents the results for the Action Alternative intersection analysis under Existing Plus Project conditions and compares these results with those under Existing conditions. As shown in the Table 3.11-4, project related traffic required to implement the Ravenswood Alternative B would result in an increase in delay greater than 0.8 seconds at the intersection of U.S. 101 SB off-ramp/Marsh Road (SR 84), which is an intersection operating at an existing unacceptable LOS E; therefore, project construction-related impacts would be potentially significant. To ensure that degradation of average delay at an intersection would not occur, a project-level mitigation measure, **SBSP Phase 2 Mitigation Measure 3.11-1**, would be required. As shown in Table 3.11-5, intersection delay increase does not result in an impact under the mitigated project condition; therefore identified impacts are reduced to a less-than-significant level.

Table 3.11-5 LOS and Delay for Existing Conditions and Mitigated Project Conditions

INTERSECTION	LOCATION (POND CLUSTER/CITY)	PEAK HOUR	EXISTING		MITIGATED PROJECT		
			DELAY[1] (SEC)	LOS	DELAY[1] (SEC)	LOS	Δ IN CRITICAL DELAY[2] (SEC)
U.S. 101 SB off-ramp/Marsh Road (SR 84)	Ravenswood/ Menlo Park	**AM**	**55.8**	**E**	**55.8**	**E**	**0.0**
		PM	44.4	D	45.8	D	1.4

Source: URS 2014
Notes:
Bold indicates LOS worse than D.
Gray shading indicates an impacted intersection.
[1] Intersection Control Delay per HCM methodology.
[2] Change in critical movement delay between existing and project conditions.

Phase 2 Mitigation Measure 3.11-1: Modify Signal Timing

The landowner (USFWS) shall coordinate with Caltrans and/or the City of Menlo Park to modify the intersection signal timing in the a.m. to reduce project-related delay to a level that the City does not deem significant.

Alternative Ravenswood B Level of Significance: Less than Significant with Mitigation

Alternative Ravenswood C. This alternative would be similar to Alternative Ravenswood B with the following exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond that is maintained at mud flat elevation for shore birds; a second water control structure would be installed on Pond R3 to improve the habitat for the snowy plover; an additional habitat transition zone would be constructed in Pond R4; and additional recreational and public access components would be constructed. The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phase. A preliminary estimate shows that construction would likely be completed in approximately 7 months over one construction season. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (5 to 10 people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; temporary traffic increases would therefore be less than significant. Impacts to recreation access from construction activities are the same as discussed for Alternative Ravenswood B.

Alternative Ravenswood C would also require a maximum of 150 daily truck trips, but for a minimum duration of 5.8 months. For the same reasons discussed for Alternative Ravenswood B, temporary traffic increases associated with the delivery of fill material would be significant. To ensure that degradation of the average delay at an intersection would not occur, **SBSP Phase 2 Mitigation Measure 3.11-1** would be required. As shown in Table 3.11-5, intersection delay increase does not result in an impact under the mitigated project condition; therefore the identified impacts are reduced to a less-than-significant level.

Alternative Ravenswood C Level of Significance: Less than Significant with Mitigation

Alternative Ravenswood D. This alternative would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create two habitat transition zones in Pond R4, establish enhanced managed ponds in Ponds R5 and S5 to improve the habitat for diving and dabbling birds, increase pond connectivity, enhance Pond R3 for snowy plover habitat, allow stormwater outflow from Redwood City to Ponds R5 and S5, remove the levees within and between Ponds R5 and S5, and improve recreation and public access The construction traffic associated with this alternative would be temporary in nature, lasting the duration of the construction phases. A preliminary estimate shows that construction would likely be completed in approximately 15 months over two construction seasons. Truck trips would be required for the transport of equipment at the beginning and end of construction and for workers commuting on a daily basis (5 to 10 people). The trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays; therefore temporary traffic increases would be less than significant.

In addition to the impacts to recreation access from the construction activities discussed in Alternative Ravenswood B, during construction of the proposed inlet headwall for the Bayfront Canal culvert and during channel excavation, public vehicle access to Bedwell Bayfront Park would be maintained. After completion of the inlet headwall, excavation would continue eastward and public vehicle access to the park would be prohibited. Public foot traffic would be allowed around the fenced construction site to Bedwell Bayfront Park until excavation of the culvert outlet begins, at which point public access would be prohibited until the completion of the project (approximately 1.5 months). The contractor would provide traffic safety control for the duration of the project.

Alternative Ravenswood D, like Alternative Ravenswood B, would also allow for a maximum of 150 daily truck trips, but would require no imported fill due to a surplus of material provided by Alternative Ravenswood D and the Bayfront Canal and Atherton Channel construction activities. Because there would be no import of fill material, the construction-related traffic would be greatly reduced and would not need to take place during peak construction hours. There would be no degradation of average delay at an intersection. For these reasons, unlike Alternatives Ravenswood B and C, **SBSP Phase 2 Mitigation Measure 3.11-1** would not be required.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.11-2: Potential long-term degradation of traffic operations at intersections and streets during operation

Alviso – Island Ponds

Alternative Island A (No Action). Under this alternative, no new activities would take place under Phase 2, and the pond cluster would continue to be monitored and managed through the activities described in the AMP. This alternative would not result in an increase in long-term traffic volumes in the area, and therefore there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternatives Island B and C (Action Alternatives). Under both of these alternatives, aside from the monitoring and management activities of the AMP and continued maintenance of the existing railroad tracks, no other operation and maintenance activities would occur. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh habitat are a component of the continued implementation of the AMP. No recreational or flood control facilities would be constructed as part of either alternative.

Due to the periodic nature of the operations and maintenance traffic, the limited number of trips generated by workers visiting the ponds, and the lack of new recreation facilities, the implementation of either of these alternatives would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area. Therefore, impacts would be less than significant.

Island Action Alternatives Level of Significance: Less than Significant

Alviso – Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, no new activities would take place under Phase 2. The USFWS would maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System and the AMP. The pond cluster would continue to be managed through the activities described in the AMP. This alternative would not result in an increase in long-term traffic volumes in the area. Therefore, there would be no impact.

Alternative Mountain View A Level of Significance: No Impact

Alternatives Mountain View B and Mountain View C. Operation and maintenance activities for components of the pond cluster within the Refuge would continue to follow and be dictated by the 2009 USACE permit #2008-00103S, applicable County operations, and the AMP. These activities would include pond maintenance, levee maintenance, nesting island maintenance, habitat transition zone maintenance, and maintenance of public access and recreational features. In addition, PG&E would continue to operate and maintain its infrastructure, and the City of Mountain View would continue to operate and maintain its properties that are included and analyzed as part of the action alternatives at this pond cluster. The increase in traffic volumes associated with the routine maintenance and monitoring activities would be minimal.

Under Alternative Mountain View B, a new trail, a viewing platform, and an interpretive platform would be installed to improve recreation and public access to these ponds. Under Alternative Mountain View C, several new trails, viewing platforms, and interpretative platforms would be installed or replaced to improve recreation and public access at the pond cluster. Operation of the new recreational facilities is anticipated to result in minimal increases in visitors to the Mountain View Ponds. However, the increased number of visitors is not anticipated to result in a substantial increase in vehicle traffic relative to the traffic volumes of the local network.

Due to the periodic nature of the operations and maintenance traffic, the limited number of trips generated by workers visiting the ponds, and the minimal increase in recreation visitors, the implementation of either of these alternatives would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area. Therefore, impacts would be less than significant.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso – A8 Ponds

Alternative A8 A (No Action). Under this alternative, no new activities would occur under Phase 2. The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices. This alternative would not result in an increase in long-term traffic volumes in the area. Therefore, there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. The Santa Clara Valley Water District would also be involved in maintaining these pond levees. These ongoing management practices would not change during or after the construction activities described above. The increase in traffic volumes associated with the routine maintenance and monitoring activities would be minimal. No new recreational facilities would be constructed as part of this alternative.

Due to the periodic nature of the operations and maintenance traffic, the limited number of trips generated by workers visiting the ponds, and the lack of new recreation facilities, the implementation of this alternative would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area. Therefore, impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, no new activities would be implemented as part of Phase 2. The USFWS would continue to maintain the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System and the AMP. The pond cluster would continue to be managed through the activities described in the AMP. This alternative would not result in an increase in long-term traffic volumes in the area. Therefore, there would be no impact.

Alternative Ravenswood A Level of Significance: No Impact

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). Operation and maintenance activities for components of the pond cluster within the Refuge would continue to follow and be dictated by the 2009 USACE permit #2008-00103S, applicable County operations, and the AMP. These activities would include pond maintenance, levee maintenance, monitoring of water control structures, habitat transition zone maintenance, interpretive station maintenance, and management of water levels. In addition, Redwood City would continue to operate and maintain its properties that are a part of the pond cluster. The increase in traffic volumes associated with the routine maintenance and monitoring activities would be minimal.

Alternative Ravenswood B would improve levees, and add an interpretive platform or educational exhibit to improve recreation and access. Alternatives Ravenswood C and Ravenswood D would construct new trails along the levee tops and construct an interpretive platform or an educational exhibit to improve recreation and access. However, operation of the new recreational facilities under all of the Ravenswood Action Alternatives is anticipated to result in minimal increases in visitors to the Ravenswood Ponds. The increased number of visitors is not anticipated to result in a substantial increase in vehicle traffic relative to the traffic volumes of the local network.

Due to the periodic nature of the operations and maintenance traffic, the limited number of trips generated by workers visiting the ponds, and the minimal increase in pond visitors, the implementation of either of these alternatives would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area. Therefore, impacts would be less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Phase 2 Impact 3.11-3: Potential increase in parking demand

Alviso – Island Ponds

Alternative Island A (No Action). Under this alternative, no new activities would take place under Phase 2. There would be no increase in visitors or parking demand. Therefore, there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternatives Island B and Island C (Action Alternatives). Under these alternatives, construction staging is not expected to be necessary at the Island Ponds, but would be established on one of the off-road levee roads used for access to the Island Ponds themselves. As such, this alternative would not generate demand for parking outside the boundary of the pond cluster.

There are no existing recreational facilities at the Island Ponds. In addition, no new recreational facilities would be constructed as part of either action alternative. The implementation of either alternative would not result in an increase in visitors or parking demand. Therefore, there would be no impact.

Island Action Alternatives Level of Significance: No Impact

Alviso – Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, no new activities would take place under Phase 2. There would be no increase in visitors or parking demand. Therefore, there would be no impact.

Alternative Mountain View A Level of Significance: No Impact

Alternatives Mountain View B and Mountain View C (Action Alternatives). Under these alternatives, construction staging may be established within the boundaries of Mountain View Shoreline Park, outside of the pond cluster. Construction vehicles and equipment may need to be staged in existing parking areas, and may therefore increase the parking demand. Under Alternative Mountain View B, a new trail, a viewing platform, and an interpretive platform would be installed to improve recreation and public access to these ponds. Under Alternative Mountain View C, several new trails, viewing platforms, and interpretative platforms would be installed or replaced to improve recreation and public access at the pond cluster. Operation of the new recreational facilities is anticipated to result in an increase in visitors to the Mountain View Ponds. The increased number of visitors is anticipated to result in a corresponding increase in parking demand.

As shown in Table 3.11-1, Mountain View Shoreline Park has 166 parking spaces, and there are approximately 200 parking spaces at the Shoreline Amphitheater Overflow Parking Lot. In addition, on-street parking is available along several nearby streets. These spaces are anticipated to provide sufficient capacity for the parking demand resulting from construction and the increase in visitors to the Mountain View Ponds. As a result, this impact is less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alviso – A8 Ponds

Alternative A8 A (No Action). Under this alternative, no new activities would take place under Phase 2. There would not be an increase in visitors or parking demand. Therefore, there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under this alternative, construction staging, if needed, would be accommodated off of public roads or public areas on the landfill access road immediately adjacent to the pond cluster. As such, this alternative would not generate demand for parking outside the boundary of the pond cluster.

No new recreational facilities would be constructed. The implementation of this alternative would not result in an increase in visitors or parking demand. Therefore, there would be no impact.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, no new activities would occur under Phase 2. There would not be an increase in visitors or parking demand. Therefore, there would be no impact.

Alternative Ravenswood A Level of Significance: No Impact

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D. Under these alternatives, construction staging may be established within the boundaries of Mountain View Shoreline Park, outside of the pond cluster. Construction vehicles and equipment may need to be staged in existing parking areas, thereby increasing the parking demand.

Alternative Ravenswood B would improve levees and would add an interpretive platform or educational exhibit to improve recreation and access. Alternatives Ravenswood C and Ravenswood D would construct new trails along the levee tops and construct an interpretive platform or an educational exhibit to improve recreation and access. Operation of the new recreational facilities is anticipated to result in minimal increases in visitors to the Ravenswood Ponds. The increase in visitors is anticipated in result in a corresponding increase in parking demand.

As shown in Table 3.11-1, 30 parking spaces are available at Bayfront Park, and 70 parking spaces are available on the northern and southern sides of the western approach to Dumbarton Bridge. In addition, on-street parking is available along several nearby streets. These spaces are anticipated to provide sufficient capacity for the parking demand resulting from construction and the increase in visitors to the Ravenswood Ponds. As a result, this impact is less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Phase 2 Impact 3.11-4: Potential increase in wear and tear on the designated haul routes during construction

The use of large trucks to transport equipment and material to and from the construction areas may affect the road conditions of the designated haul routes. Arterial and collector streets are designed to accommodate a variety of vehicle types, including heavy trucks. However, residential streets are not designed with a pavement thickness to withstand substantial truck traffic.

Alviso – Island Ponds

Alternative Island A (No Action). As discussed above, under this alternative, no construction activities would take place at the Alviso-Island Ponds. As such, no construction trips would take place and there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternatives Island B and Island C (Action Alternatives). Implementation of Alternative Island B would remove, breach, or lower the levees between Ponds A19 and A20. Implementation of Alternative Island C would include all of the components of Alternative Island B as well as three additional components: levee breaches on the north sides of ponds A20 and A21, pilot channels in Pond A19, and widening of the existing breaches on the southern levee of Pond A19.

The designated access routes for the construction truck trips at the Island Ponds would include Fremont Avenue, Warren Avenue, and Landing Road. Per the *City of Fremont General Plan* (Fremont 2011), Fremont Avenue and Warren Avenue are classified as minor arterial streets. Landing Road is classified as a local road; however, it is zoned for industrial/tech, not residential. As such, these roads were designed to withstand substantial truck traffic. Under the action alternatives for the Island Ponds, there would be no hauling of material into or out of these ponds. Passenger trucks would enter and exit daily, and there would be seasonal delivery of large construction equipment at the beginning and end of each construction season. Therefore, construction truck trips would not increase wear and tear on these roads, and the impact would be less than significant.

Island Action Alternatives Level of Significance: Less than Significant

Alviso – Mountain View Ponds

Alternative Mountain View A (No Action). As discussed above, under this alternative, no construction activities would take place at the Mountain View pond cluster. As such, no construction trips would take place and there would be no impact.

Alternative Mountain View A Level of Significance: No Impact

Alternatives Mountain View B and Mountain View C (Action Alternatives). Alternative Mountain View B would introduce tidal flows to Ponds A1 and A2W by breaching levees at several points. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough.

The designated access routes for the construction truck trips at the Mountain View Ponds would include San Antonio Road and Shoreline Boulevard. Both of these roads are classified as major arterial streets. As such, these roads were designed to withstand substantial truck traffic. Therefore, construction truck trips would not increase wear and tear on these roads, and the impact would be less than significant.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso – A8 Ponds

Alternative A8 A (No Action). As discussed above, under this alternative, no construction activities would take place at the A8 Ponds. As such, no construction trips would take place and there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under this alternative, habitat transition zones could be constructed in Pond A8S's southwest corner, southeast corner, or both.

The designated access routes for the construction truck trips at the A8 Ponds would include Great America Parkway and Gold Street. Per the *City of San Jose General Plan* (2011), Great America Parkway is classified as a major arterial street. Gold Street is classified as a local street; however, it is zoned for commercial/industrial, not residential. As such, these roads were designed to withstand substantial truck traffic. Therefore, construction truck trips would not increase wear and tear on these roads, and the impact would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). As discussed above, under this alternative, no construction activities would take place at the Ravenswood Ponds. As such, no construction trips would take place and there would be no impact.

Alternative Ravenswood A Level of Significance: No Impact

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). All three Ravenswood Action Alternatives would introduce tidal flows to Pond R4 to and improve levees to provide additional flood protection. Alternative Ravenswood C would include several improvements beyond what would be done for Alternative Ravenswood B, and Ravenswood D would include improvements beyond what would be implemented for Alternatives Ravenswood B and C.

The designated access route for construction truck trips at the Ravenswood Ponds would include Marsh Road and a levee road. Marsh Road is classified as a primary arterial street in the Menlo Park General Plan (Menlo Park 1994). As such, it is designed to withstand substantial truck traffic. Therefore, construction truck trips would not increase wear and tear on these roads, and the impact would be less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.11-6. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP and other Refuge management practices and documents. The traffic analysis required project-level mitigation measure **SBSP Phase 2 Mitigation Measure 3.11-1** in order to reduce **SBSP Phase 2 Impact 3.11-1** to a level that was less than significant.

Table 3.11-6 Phase 2 Summary of Impacts – Traffic

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.11-1: Potential short-term degradation of traffic operations at intersections and streets due to construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTSM	LTSM	LTS
Phase 2 Impact 3.11-2: Potential long-term degradation of traffic operations at intersections and streets during operation.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.11-3: Potential increase in parking demand.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS
Phase 2 Impact 3.11-4: Potential increase in wear and tear on the designated haul routes during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA).
LTS = Less than Significant
LTSM = Less than Significant with Mitigation
NI = No Impact

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3.12 Noise

This section of the Final Environmental Impact Statement/ Environmental Impact Report (referred to throughout as the Final EIS/R) characterizes the existing noise resources within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on noise quality. The information presented is based on a review of the existing noise resources within the area and pertinent federal, state and local regulations. Using this information as context, an analysis of the noise-quality-related environmental impacts of the project is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only discusses additional mitigation or project-level measures as needed.

3.12.1 Physical Setting

Introduction and Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). It includes a summary of the physical setting, existing noise levels, and the regulatory setting. Applicable regional, state, and local plans and policies concerning noise and vibration were reviewed during preparation of this Final EIS/R.

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration, and as any pressure variation in air that the human ear can detect. Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss may both result in permanent hearing damage. Also, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 1998).

Noise Descriptors. The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Caltrans 1998; Lipscomb and Taylor 1978).

- L_{max} (Maximum Noise Level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the peak (noise) level.
- L_{min} (Minimum Noise Level): The minimum instantaneous noise level during a specific period of time.

- L_X (Statistical Descriptor): The noise level exceeded X percent of a specific period of time.
- L_{eq} (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in A-weighted decibels (dBA) are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels;
- L_{dn} (Day-Night Noise Level): The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- CNEL (Community Noise Equivalent Level): The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur during the noise sensitive hours between 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.
- SENL (Single Event [Impulsive] Noise Level): The SENL describes a receiver's cumulative noise exposure from a single impulsive noise event, which is defined as an acoustical event of short duration that involves a change in sound pressure above some reference value. SENLs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level L_{eq}, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows good correlation with community response to noise.

Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency. Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact piledriving, and wrecking balls. Continuous vibrations result from vibratory piledrivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

Regional Setting

The communities along San Francisco Bay (Bay) are primarily urban in character; however, open space and other undeveloped areas (including ecological reserves, wildlife refuges, and parks) fringe the southern portion of the Bay and are scattered in and around the communities.

Noise-Sensitive Uses

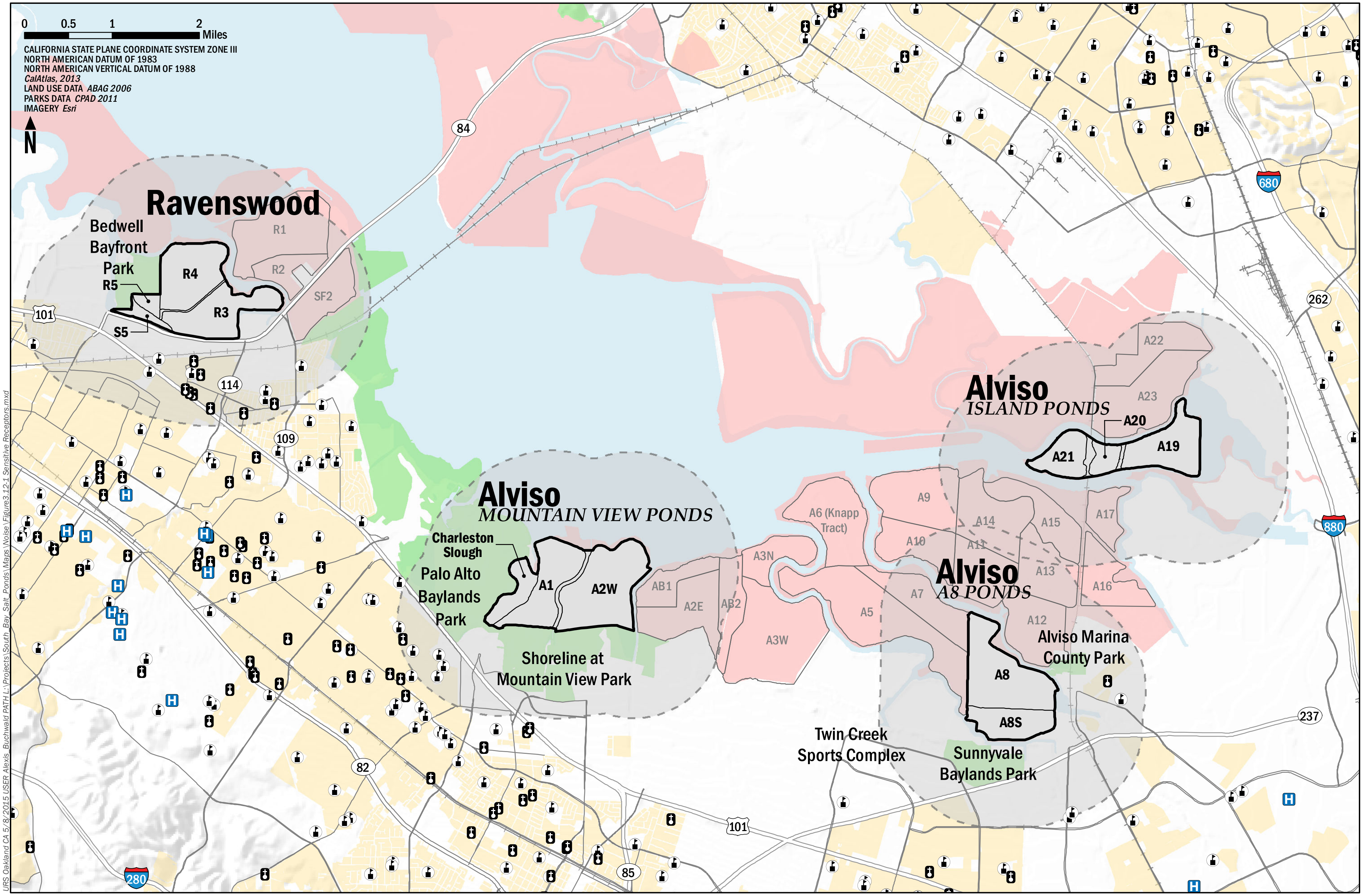
Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects and uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other noise-sensitive land uses include schools, hospitals and health-care facilities, parks, hotels, offices, places of worship, libraries, and other uses where low interior noise levels are essential. Figure 3.12-1 shows the locations of nearby noise-sensitive receptors. The locations of these receptors in relation to Phase 2 project area pond clusters are discussed below.

Project Setting

As discussed in Section 3.8, Land Use, the current land uses closest to the Phase 2 project area primarily consist of commercial, industrial, and open-space uses. Sensitive land uses, including residential areas and schools, are typically farther away from the pond clusters than those less sensitive uses, divided by either highway or railroad corridors. Exceptions are the community of Alviso, which is to the east of the A8 pond cluster (across the Guadalupe River and Alviso Slough), and the Shoreline Park in Mountain View Park, which is to the south of the Alviso-Mountain View pond cluster.

Alviso-Island Ponds

The Alviso-Island Ponds (Ponds A19, A20, and A21) are bounded by Coyote Creek to the south, Mud Slough to the north, and their confluence and San Francisco Bay to the west. To the east are the Warm Springs Restoration Area (part of the Refuge) and an industrial-use area. No major noise sources are generated from the operation of these ponds. As such, noise levels are primarily influenced by nearby uses such as surface streets and industrial uses, all of which are more than a ½ mile to the east of Pond A19 (which is the closest pond to any noise-generating uses). The existing Union Pacific Railroad (UPRR) line that separates Ponds A20 and A21 also influences existing noise levels within this pond cluster. The noise level along Interstate 880 is approximately 75 dBA (CNEL) based on the vehicle volume traveling along the highway. Noise levels decrease to 55 dBA (CNEL) at approximately ½ mile from SR 880 (City of Fremont 2011). The closest sensitive land uses to the Island Ponds are residential communities, approximately 2.5 miles to the east of Pond A19 (Figure 3.12-1).



URS Oakland CA 5/8/2015 USER Alexis_Buchwald PATH L:\Projects\South_Bay_Salt_Ponds\Maps\Noise\Figure3.12-1 Sensitive Receptors.mxd

LEGEND

Hospital	Park	Project Areas 1 Mile Buffer
Church	Refuge	Phase 2 Project Area
School	Residential	

URS
South Bay Salt Pond Restoration Project

Figure 3.12-1
Sensitive Receptors

Alviso-Mountain View Ponds

The Alviso-Mountain View Ponds (Ponds A1 and A2W and Charleston Slough) are the westernmost ponds of the Alviso pond complex. Ponds A1 and A2W are north of the City of Mountain View and the city's Shoreline Park, and east of the City of Palo Alto and the Palo Alto Flood Basin and the Palo Alto Baylands Park and Nature Preserve, immediately adjacent to Charleston Slough. Parkland and public recreation, primarily at Mountain View's Shoreline Park and the sailing lake within this park, are the primary land uses in the vicinity of the Alviso-Mountain View pond cluster. No major noise sources are generated from the operation of these ponds in their current state.

Nearby land uses include light industrial uses in the City of Mountain View. Shoreline Park contains recreational trails (including portions of the Bay Trail), the Shoreline Golf Links, and the Shoreline Park sailing lake. These recreational and nearby industrial uses constitute the existing noise conditions within the Mountain View pond cluster. The noise level along U.S. Highway 101 is approximately 70 dBA (CNEL) based on the vehicle volume traveling along the highway. Noise levels decrease to 60 dBA (CNEL) at approximately 1,500 feet from U.S. Highway 101 (City of Mountain View 2013). Overhead flights from Moffett Field and Mineta San Jose International Airport also contribute to existing ambient noise levels. The nearest sensitive receptors would be users of the at Mountain View Shoreline Park, directly south of Ponds A1 and A2W, and a manufactured-home residential community, about 0.64 mile (3,400 ft) to the south of Pond A2W (Figure 3.12-1).

Alviso-A8 Ponds

Ponds A8 and A8S are in the south-central portion of the Alviso pond complex. This cluster is bounded by Alviso Slough to the northeast; the City of Sunnyvale, a business park built on a closed landfill, and Baylands Community Park to the south; Guadalupe Slough to the west; and the Alviso neighborhood of the city of San Jose to the east. No major noise sources are generated from the operation of this pond; as such, noise levels on-site are primarily influenced by external noise sources such as overflights and recreation adjacent to the pond. The noise level along SR 237 is approximately 75 dBA (CNEL) based on the vehicle volume traveling along the highway. Noise levels decrease to 60 dBA (CNEL) at approximately 660 feet from SR 237 (City of Sunnyvale 2013). The closest sensitive uses within the community of Alviso are approximately 600 feet to the east of Pond A8 (Figure 3.12-1).

Ravenswood Ponds

The Phase 2 Ravenswood pond cluster consists of Ponds R3, R4, R5, and S5, the levees surrounding each of these ponds, some of the fringe marsh outside of these levees, and the All-American Canal (AAC), a former brine ditch used as part of the Cargill salt works. The pond cluster is bounded by Greco Island and open bay water to the north, Ravenswood Slough to the east, SR 84 and the City of Menlo Park to the south, and Menlo Park's Bedwell Bayfront Park to the west. Noise levels in this pond cluster are greatly influenced by vehicular traffic on SR 84 (Dumbarton Bridge), which extends through the southern portion of the Ravenswood pond complex, and on the Bayfront Expressway, along the western boundary of the pond cluster. The noise level along SR 84 is approximately 70 dBA (CNEL) based on the vehicle volume traveling along the highway. Noise levels decrease to 60 dBA (CNEL) at a distance of approximately a ¼ mile to almost a ½ mile from SR 84. The noise level along U.S. Highway 101 is approximately 70 dBA (CNEL) based on the vehicle volume traveling along the highway from a distance of approximately 660 feet, decreasing to 65 dBA (CNEL) at a distance of approximately a ¼ mile (City of Menlo Park 2013). Other noise sources include the Union Pacific Railroad tracks (less than ¼ mile south of the pond complex) and airplanes flying overhead to and from the San Carlos Airport (situated less than 5 miles to the northwest). No major noise sources exist within this pond cluster. Intermittent noises can be heard in the vicinity of recreational facilities (see Section 3.6, Recreation Resources, for descriptions of these locations). No sensitive receptors occur within the Ravenswood pond cluster. The nearest sensitive receptors are more than 700 feet south of Pond R3 (Figure 3.12-1).

3.12.2 Regulatory Setting

Noise is regulated in the Phase 2 project area and the regional area through implementation of local general plan policies and noise regulations. Local general plans identify general principles intended to guide and influence development plans, and noise regulations set forth specific standards and procedures for addressing particular noise sources and activities.

Generally, the goal of noise regulations is to protect the health and welfare of the public by minimizing excessive, unreasonable, and unnecessary noise. Each jurisdiction defines unacceptable noise levels and, in most cases, noise level standards and work hour limitations, to achieve this goal.

Laws and Regulations

Alviso-Island Ponds

Alameda County. The Alameda General Plan Countywide Noise Element provides background information about evaluating the effects of noise on communities and the current regulatory framework. It also presents baseline information for the existing noise environment in Alameda County, along with goals, policies, and actions for controlling noise in existing and future development (Alameda County 1994). Acceptable noise levels range from 55 to 65 L_{dn} for residential and educational uses to 70 L_{dn} for commercial and to 75 L_{dn} for industrial and open-space recreation and parks uses.

Relevant countywide noise policies include the following.

<u>Goal #1:</u>

> The peace, health, safety, and welfare of the residents of Alameda County require protection from excessive, unnecessary, and unreasonable noises from any and all sources in the cities and unincorporated territory.

<u>Goal #2:</u>

> Promote the compatibility of land uses with respect to noise generation by legislatively protecting sensitive land uses from noise sources.

Chapter 6.60, Noise, of the Alameda County Code of Ordinances prohibits unnecessary, excessive, and annoying noise to ensure public health, welfare, and safety (Alameda County 1966). This chapter provides maximum exterior noise limits for specific land uses during specified time periods. Permissible noise levels range from 45 to 65 dBA for residential and public area uses and from 60 to 80 dBA for commercial properties during the night (10 p.m. to 7 a.m.). Permissible noise levels range from 50 to 70 dBA for residential and public area uses and from 65 to 85 dBA for commercial properties anytime during the day (7 a.m. to 10 p.m.).

City of Fremont. The City of Fremont General Plan (City of Fremont 2011) includes the following relevant policies.

Policy 10-8.2: Acceptable Noise Environment:

Guidelines articulated by Table 10-4 are not intended to be applied reciprocally. In other words, if an area currently is below the desired noise standards, an increase in noise up to the maximum should not necessarily be allowed. The impact of a proposed project on an existing land use should be evaluated in terms of potential for adverse community response based on a substantial increase in existing noise levels, regardless of the compatibility guidelines.

Policy 10-8.5: Construction Noise Levels:

Control construction noise at its source to maintain existing noise levels and in no case to exceed the acceptable noise levels.

Chapter 18.160, Construction Hours, of the Fremont Municipal Code contains noise performance standards for the land uses within the city, at the property line nearest the source of a suspected violation. The maximum noise generated by such use cannot exceed 60 dBA when adjacent uses are residential, park, or institutional uses. Less stringent standards apply to adjacent commercial or industrial uses (65 to 70 dBA, respectively). Excluded from these standards are occasional sounds generated by the movement of railroad equipment, temporary construction activities, or warning devices. Section 18.160.010 of the Fremont Municipal Code limits construction activity hours within 500 feet of one or more residences, lodging facilities, nursing homes, or inpatient hospitals to the weekday hours of 7:00 a.m. to 7:00 p.m. and the Saturday or holiday hours of 9:00 a.m. to 6:00 p.m., and Sunday construction is not allowed. Construction activity for projects not within 500 feet of residences, lodging facilities, nursing homes, or inpatient hospitals shall be limited to the weekday hours of 6:00 a.m. to 10:00 p.m. and the weekend or holiday hours of 8:00 a.m. to 8:00 p.m. A holiday shall be as defined in Section 2.35.010 (City of Fremont 2005).

Alviso-Mountain View Ponds

Santa Clara County. The Santa Clara County General Plan provides noise compatibility standards for land use within the county and strategies and policies to ensure that residents are free from noise that affects their health and well-being (Santa Clara County 1994). Satisfactory noise levels range from 45 to 55 L_{dn} for residential uses, hotel uses, parks, open-space reserves, and wildlife refuges; 65 L_{dn} for public or semipublic facilities (churches, hospitals, nursing homes, school, libraries, and civic buildings); 65 L_{dn} for other non-hotel commercial uses and agricultural uses; and 70 L_{dn} for industrial uses.

Relevant noise strategies, policies, and implementation include:

Strategy #1: Prevent or Minimize Noise Conflicts:

> C-HS 24. Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility.
>
> C-HS 25. Noise impacts from public and private projects should be mitigated.

> C-HS(i) 25. Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.

Chapter VIII, Section B-11 of the Santa Clara County Code prohibits unnecessary, excessive, and annoying noise to ensure public health, welfare, and safety (Santa Clara County 2003). This section provides maximum exterior noise limits for specific land uses during specified time periods. Permissible noise levels range from 45 to 75 dBA for residential uses during the night (10 p.m. to 7 a.m.) to heavy industrial uses anytime during the day, respectively. Residential public space is limited to 55 dBA during the daytime hours (7 a.m. to 10 p.m.). Higher noise levels are permitted for construction and demolition activities. The maximum noise levels for repetitively scheduled and relatively long-term operation of stationary equipment ranges from 60 to 70 dBA between the hours of 7 a.m. to 7 p.m., depending on the land use. Noise levels for nonscheduled, intermittent short-term operation increases by 15 dBA above the stationary source level.

The Santa Clara County Code also provides exterior noise limits for various receiving land use categories. For one- to two- story residential uses, noise levels cannot exceed 45 and 55 dBA for more than 30 minutes in any hour from 10 p.m. to 7 a.m. and from 7 a.m. to 10 p.m., respectively (Santa Clara County 2003).

Mountain View. The City of Mountain View 2030 General Plan (City of Mountain View 2012) provides noise acceptability guidelines for specific land uses and identifies policies to meet the city's goal to reduce noise and its effects on people. Normally acceptable external noise levels for public parks, recreation, and passive open space range from 50 to 70 L_{dn} or CNEL. Levels above 70 L_{dn} are either normally unacceptable or clearly unacceptable (Table 7.1 of the City of Mountain View 2030 General Plan). Acceptable noise levels for commercial, intensive open-space, and industrial uses are higher.

Section 8.23 of the Mountain View Municipal Code provides limitations on the hours of construction. Construction activity (any physical activity on the construction site or in the staging area, including the delivery of materials) is limited to the hours of 7 a.m. and 6 p.m., Monday through Friday (City of Mountain View 2003). Construction activity is not permitted on Saturday or Sunday or holidays unless prior written approval is granted by the building official. Construction hours can be modified by the building official, with sufficient notice and as long as appropriate signage is installed. The City of Mountain View Municipal Code does not provide noise limitations for stationary noises.

Alviso-A8 Ponds

Santa Clara County. The Santa Clara County General Plan provides noise compatibility standards for land use within the county and strategies and policies to ensure that residents are free from noise that affects their health and well-being (Santa Clara County 1994). Satisfactory noise levels range from 45 to 55 L_{dn} for residential uses, hotel uses, parks, open-space reserves, and wildlife refuges; 65 L_{dn} for public or semipublic facilities (churches, hospitals, nursing homes, school, libraries, and civic buildings); 65 L_{dn} for other non-hotel commercial uses and agricultural uses; and 70 L_{dn} for industrial uses.

Relevant noise strategies, policies, and implementation include:

Strategy #1: Prevent or Minimize Noise Conflicts:

> C-HS 24. Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility.
>
> C-HS 25. Noise impacts from public and private projects should be mitigated.
>
> C-HS(i) 25. Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.

Chapter VIII, Section B-11 of the Santa Clara County Code prohibits unnecessary, excessive, and annoying noise to ensure public health, welfare, and safety (Santa Clara County 2003). This section provides maximum exterior noise limits for specific land uses during specified time periods. Permissible noise levels range from 45 to 75 dBA for residential uses during the night (10 p.m. to 7 a.m.) to heavy industrial uses anytime during the day, respectively. Residential public space is limited to 55 dBA during the daytime hours (7 a.m. to 10 p.m.). Higher noise levels are permitted for construction and demolition activities. The maximum noise levels for repetitively scheduled and relatively long-term operation of stationary equipment ranges from 60 to 70 dBA between the hours of 7 a.m. to 7 p.m., depending on the land use. Noise levels for nonscheduled, intermittent short-term operation increases by 15 dBA above the stationary source level.

The Santa Clara County Code also provides exterior noise limits for various receiving land use categories. For one- to two- story residential uses, noise levels cannot exceed 45 and 55 dBA for more than 30 minutes in any hour from 10 p.m. to 7 a.m. and from 7 a.m. to 10 p.m., respectively (Santa Clara County 2003).

San Jose. The City of San Jose General Plan 2040 identifies goals and policies to reduce noise impacts on people. Specifically, its goal is to minimize noise levels through noise reduction and suppression techniques and appropriate land use policies. The city's acceptable noise level objectives are 55 L_{dn} for long-range exterior noise quality level, and 60 L_{dn} for the short-range exterior noise quality level (City of San Jose 2011).

Chapter 20 of the City of San Jose Municipal Code provides exterior noise standards for specific land use districts. Noise level standards vary from a maximum noise level of 55 dBA (e.g., residential) to 70 dBA (e.g., industrial or open space next to industrial uses) unless a conditional use permit is granted. The San Jose Municipal Code does not specifically call out noise exemptions for construction activities (City of San Jose 2004).

Sunnyvale. The goals of the Noise Sub-Element of the City of Sunnyvale General Plan (City of Sunnyvale 2011) is to maintain a compatible noise environment for all land uses in the community, reduce transportation noise, and maintain or achieve acceptable limits for the levels of noise generated by land use operations and single events. The general plan identifies policies and action statements to achieve these goals.

Section 16.08.110 of the Sunnyvale Municipal Code specifies noise limitations and hours of construction. The section describes qualitative noise standards that include no loud environmentally disruptive noises (e.g., air compressors without mufflers, continuously running motors or generators, loud-playing musical instruments and radios) if such noises are a nuisance to adjacent residential neighborhoods. Construction is permitted between 7 a.m. and 6 p.m. Monday through Friday and 8 a.m. and 5 p.m. on Saturdays. Construction activities are prohibited within the city on Sundays and national holidays. Exceptions to these hours are permitted only for homeowners (City of Sunnyvale 2013).

The City of Sunnyvale Municipal Code does not provide noise limitations for stationary noises.

Ravenswood Ponds

San Mateo County. The San Mateo General Plan provides noise compatibility standards for land use within the county and strategies and policies to ensure that residents are free from noise that affects their health and well-being (San Mateo County 1986). Satisfactory noise levels range from 50 to 65 L_{dn} for residential and transient-lodging uses to 70 L_{dn} for semipublic facilities (churches, hospitals, nursing homes, schools, libraries, civic buildings, halls, and theaters) and office buildings to 75 L_{dn} for industrial, open-space and recreation, and outdoor sports uses.

Chapter 4.88, Noise, of the San Mateo County Code of Ordinances prohibits unnecessary, excessive, and annoying noise to ensure public health, welfare, and safety (San Mateo County 1982). This chapter provides maximum exterior noise limits for specific land uses during specified time periods. Permissible noise levels range from 50 to 70 dBA for residential and semipublic facilities (churches, hospitals, schools, and libraries) during the night (10 p.m. to 7 a.m.) and from 55 to 75 dBA during the day (7 a.m. to 10 p.m.).

Menlo Park. The City of Menlo Park General Plan (City of Menlo Park 2013) provides noise acceptability guidelines for specific land uses and identifies policies to meet the city's goal to reduce noise and its effects on people. Normally acceptable external noise levels for public parks, recreation, and passive open space range from 50 to 75 L_{dn} or CNEL. Levels above 70 L_{dn} are either normally or clearly unacceptable. Acceptable noise levels for commercial, intensive open space, and industrial uses are higher.

Section 8.06.030 of the Menlo Park Municipal Code defines the noise limitations within city boundaries. For all sources of sound measured from any residential property, the night- and day-time noise limitations are 50 dBA and 60 dBA, respectively (City of Menlo Park 2004). Construction activities are allowed between the hours of 8 a.m. and 6 p.m. Monday through Friday. Exceptions are granted when a use permit is issued by the city that specifically allows noise levels to be exceeded, but this requires posting of signage with the permitted hours of construction. Limitations are also set for powered equipment that is operated on a temporary, occasional, or infrequent basis between the hours of 8 a.m. and 6 p.m. Monday through Friday. No piece of equipment is allowed to generate levels in excess of 85 dBA at 50 feet.

3.12.3 Environmental Impacts and Mitigation Measures

Approach to Analysis – Construction

The following sections provide an overview of how construction activities may generally influence existing noise conditions in relation to each Phase 2 pond cluster. It describes predicted noise and vibration levels created by certain construction equipment that are used later to prepare the impact assessment according to the stated thresholds of significance. This overview is intended to inform the impact assessment by presenting the key concepts associated with the noise and vibration impact assessment.

Construction activities would occur under the SBSP Phase 2 Restoration Project Action Alternatives (Alternatives Island B, Island C, Mountain View B, Mountain View C, A8 B, Ravenswood B, Ravenswood C, and Ravenswood D). Construction activities would not occur under the No Action Alternatives (Alternatives Island A, Mountain View A, A8 A, and Ravenswood A).

Construction Noise

Noise impacts from construction equipment would depend on the type of activity, the equipment used, and the distance from sensitive receptors. A discussion of the typical construction equipment that would be used and their associated noise levels, the distances of the SBSP Phase 2 Restoration Project sites from sensitive receptors, and projected noise levels at the sensitive receptors from construction and operation of the project are presented below.

In general, construction activities would include excavation, backfilling, material transport, and other miscellaneous activities (using both land-based and amphibious equipment). For various pond clusters and for various alternatives, on-site construction equipment may include (but is not limited to) long-reach excavators, amphibious excavators, barges, bulldozers, dump trucks, a compaction roller, a water tanker, refueling tanks, cranes, piledrivers, and pickup vehicles for transportation in and out of a project site. Water-based equipment may include small barges. According to the Federal Transit Administration’s (FTA’s) Transit Noise and Vibration Assessment (FTA 2006), noise levels for typical construction equipment (including those listed above) range from 74 to 101 dBA at 50 feet without feasible control measures. Table 3.12-1 provides a summary of typical noise levels generated by construction equipment at a distance of 50 feet with and without feasible noise controls installed. Noise levels could decrease by 1 dBA to as much as 16 dBA with feasible noise-control measures such as intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers’ specifications.

Table 3.12-1 Typical Construction-Equipment Noise Levels for Various Types of Equipment

TYPES OF EQUIPMENT	NOISE LEVEL IN DBA AT 50 FT WITHOUT FEASIBLE NOISE CONTROL[1]
Dozer or tractor	85
Excavator	88
Front-end loader	85
Backhoe	80
Vibratory roller	74
Crane	83
Truck	88
Pile driver (impact)	101
Pile driver (sonic)	96
Water pump	76
Dump truck	88
Compaction roller	74
Diesel generator	81

Source: FTA 2006.
1. Feasible noise controls include the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers’ specifications.

Tables 3.12-2 and 3.12-3 show the distances of the nearest sensitive receptors from construction and operations and maintenance (O&M) activities at each Phase 2 pond cluster and the predicted noise levels at various distances, respectively. Short-term construction activities would include general earthmoving activities using the equipment identified in Table 3.12-1. Table 3.12-2 distinguishes between general construction activities and piledriving activities. General construction activities can occur anywhere within the pond clusters, so the edges of the ponds closest to sensitive receptors were used to determine the approximate distance to the nearest sensitive receptors. Piledriving activities would only be required to install boxcar bridges and repair or install water control structures, and the project would utilize the sonic piledriving (vibration) method. These are short-term construction actions that would not be an ongoing part of the construction work and would occur in only two or three places at each pond cluster.

The existing and proposed water control structures and the locations of the proposed boxcar bridges are shown in the Phase 2 restoration plans (Figures 2-3 through 2-14) in Chapter 2, Alternatives. As such, the distance from piledriving activities to the nearest sensitive receptors can be better approximated than other general construction activities. The assumptions about the distances from work sites form the basis of the analyses presented later in this section.

Table 3.12-2 Project Alternatives: Distances to the Nearest Sensitive Receptors

PHASE 2 POND COMPLEX / POND	APPROXIMATE DISTANCE FROM THE NEAREST CONSTRUCTION (EARTHMOVING) ACTIVITIES (FT)[1]	APPROXIMATE DISTANCE FROM THE NEAREST PILEDRIVING ACTIVITY (FT)[2]
Alviso-Island Ponds		
A19	10,000	—
A20	13,500	—
A21	17,000	—
Alviso-Mountain View Ponds		
A1	3,400	—
A2W	6,700	6,900 (PG&E tower foundation)
Charleston Slough	3,400	—
Alviso-A8 Ponds		
A8S	1700	—
A8	2,100	—
Ravenswood Ponds		
R3	1,000	2,200 (R3/S5 WCS)
R4	2,800	3,300 (R4/R5 WCS)
R5	2,400	3,300 (R4/R5 WCS)
S5	1,600	1,900 (S5/Flood Slough WCS)

Note: Distances are rounded to the nearest 100 ft.

1. The distances are measured from the edge of the pond closest to the sensitive receptors (residential uses). Earthmoving activities may occur anywhere within the pond complexes

2. The distances are measured from the location where piledriving (sonic) would occur (typically at water control facilities) to the nearest sensitive receptors.

PG&E = Pacific Gas and Electric Company
WCS = water control structure

Table 3.12-3 Predicted Construction Noise Levels at Various Distances

PHASE 2 PONDS CONSTRUCTION SITES[1]	DISTANCE BETWEEN CONSTRUCTION SITES AND SENSITIVE RECEPTORS (FT)[2]	PREDICTED PEAK CONSTRUCTION NOISE LEVELS (DBA)
Baseline	**50**	**102**
R3	1,000	77
S5	1,600	72
A8	1,700	72
R5	2,400	69
R4	2,800	68
A8S	3,000	67
A1	3,400	66
Charleston Slough	3,400	66
A2W	6,700	60
A19	10,000	57
A20	13,500	54
A21	17,000	52

Note: Noise levels are based on attenuation at 6 dB for doubling of distance.

1. The nearest sensitive receptors are based on the measurement from the edge of the pond closest to the sensitive receptors to the sensitive receptors.

2. No sensitive receptors are within 50 ft of the Phase 2 project area. This distance and associated noise level are presented to identify the assumed equipment noise levels at 50 ft. The subsequent distances and noise levels show how such noise levels attenuate as distance increases.

Table 3.12-3 shows the calculated predicted noise levels at various distances associated with construction activities. It also shows the expected noise levels at sensitive receptors at specific ponds. The noise levels were calculated based on the following two assumptions (used in the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R [2007 EIS/R] and thus reapplied here):

- Combined intermittent noise levels of 102 dBA at 50 feet without feasible noise control, based on the simultaneous use of the three noisiest types of construction equipment shown in Table 3.12-1; and
- A typical noise-attenuation rate of 6 dBA per doubling of distance.

The assumption associated with the use of the three noisiest types of construction equipment provides for the most conservative analysis of potential noise levels associated with construction activities at each of the Phase 2 pond clusters and for each Phase 2 Action Alternative. It should be noted that in some cases, piledriving is not necessary, and use of a sonic/vibratory driver would further reduce peak noise levels. Also, each piledriving activity would be done in a few hours or a day at most, reducing the duration of that noise. In other cases, construction activities would not occur at the edge of the pond nearest to the sensitive receptors, so noise levels would likely be lower than those reported below. Finally, construction activities would not only occur at the edge of the pond, but would likely be distributed throughout the pond or pond clusters. In those cases, the longer distance between sensitive receptors and the construction work area would further decrease noise levels through distance attenuation.

Construction Traffic-Related Noise

The upland fill material would be brought to the Phase 2 ponds by trucks. Assuming transportation of fill only occurs using trucks with a storage capacity of 11 cubic yards (cy) per truck, over 57,000 one-way truck trips would be required to fulfill the high-end estimate of total fill required for all Phase 2 alternatives considered here. These truck trips are not actually generated by the SBSP Restoration Project. The material would come from other, unrelated construction projects in nearby communities. So, in the absence of the SBSP Restoration Project, the material would be generated and transported to a landfill or other disposal site. Thus, this analysis only addresses the transportation of the material from the nearest highway or major arterial to the ponds where it would be used.

The truck trips would occur over several construction seasons. Up to 200 one-way truck trips would be generated daily for the delivery of fill material at the Alviso-Mountain View cluster, up to 180 daily trips at the Alviso-A8 cluster, and up to 150 daily trips at the Ravenswood cluster (as described in Section 3.11, Traffic). These trips are calculated by alternative in Table 3.12-4. For the purposes of this analysis, one-way daily trips are used. Detailed evaluations of traffic-related noise impacts based on more realistic estimates are conducted as part of the project-level environmental review below.

Table 3.12-4 Construction Fill (CY) and Truck Trips

POND CLUSTER	ALTERNATIVE	VOLUME OF FILL IMPORTED BY TRUCK (CY)	TRUCK TRIPS	CONSTRUCTION PERIOD INVOLVING HAULING FILL (MONTHS)1	ONE-WAY MAX DAILY TRUCK TRIPS
Island	Alternative B	—	—	—	—
Island	Alternative C	—	—	—	—
Mountain View	Alternative B	296,400	26,945	6.1	200
Mountain View	Alternative C	369,600	33,600	7.6	200
A8	Alternative B	48,600	4,418	1.1	180
Ravenswood	Alternative B	37,900	3,445	1.0	150
Ravenswood	Alternative C	210,400	19,127	5.8	150
Ravenswood	Alternative D[2]	—	—	—	—

1. For this analysis, a typical month has 22 work-days.

2. Cut volumes for Alternative Ravenswood D would be 56,700 cy, but the City of Redwood City's associated Bayfront Canal and Atherton Channel Project would generate a surplus of 31,200 cy that would be available for use in the Ravenswood Ponds; this creates a surplus of material of almost 15,000 that could be used on-site for other levee enhancements or restoration features.

Construction-Related Vibration

Construction activities would generate vibration. Vibration levels depend on the specific construction equipment used and the operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increased distance. Table 3.12-5 shows the vibration levels generated by typical construction equipment. The California Department of

Transportation's (Caltrans') recommended standard with respect to the prevention of structural building damage is 0.2 in/sec peak particle velocity (PPV) for normal structures, and the FTA's maximum-acceptable vibration standard is 80 vibration decibels (VdB) (FTA 2006) with respect to human annoyance for residential uses. As shown in Table 3.12-5, the highest vibration associated with construction equipment for all Phase 2 Action Alternatives would be generated from impact piledrivers. Vibration created by piledrivers would exceed both the Caltrans and the FTA standards at a distance of 25 feet. The use of trucks, drilling, and bulldozers would also exceed FTA standards at 25 feet with respect to human annoyance for residential uses. In general, piledriving would be used wherever cofferdams and dewatering would be needed (the sheet piles to form the cofferdams would need to be driven). The two places where this need exists are where the boxcar bridges and the water control structures are to be located. Predicted vibration levels at nearby sensitive receptors from construction activities are shown in Table 3.12-6.

Table 3.12-5 Typical Construction Equipment Vibration Levels

EQUIPMENT		PPV AT 25 FT (IN/SEC)[1]	APPROXIMATE LV AT 25 FT[2]
Piledriver (impact)	Upper range	1.518	112
	Typical	0.644	104
Piledriver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large bulldozer		0.089	87
Trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: FTA 2006.

1. PPV is the peak particle velocity

2. Lv is the velocity level in decibels (VdB) referenced to 1 μinch/second and based on the root mean square (RMS) velocity amplitude.

Table 3.12-6 Predicted Vibration Levels at Nearby Sensitive Receptors from Construction Activities

DISTANCE (FT)	PPV (IN/SEC)	APPROXIMATE LV (VDB)	EQUIPMENT USED	PROJECT CONSTRUCTION SITES (CLOSEST POND)[1]
10,000	0.00001	9.7	Bulldozer	Island (Pond A19)
6,900	0.0003	39.0	Piledriving	Mountain View (Pond A2W)
2,100	0.0001	29.9	Bulldozer	A8 (Pond A8)
1,900	0.0021	55.6	Piledriving	Ravenswood (Ponds R3, R4, R5, and S5)

Note: Vibration levels generated by piledriving and/or other construction equipment as designated in the fourth column.

1. Pond that is closest to a sensitive receptor.

PPV at 25 feet is based on FTA 2006. To calculate PPV at other distances, the following equation (FTA 2006) was used:

PPV at distance D = PPV (at 25 ft) * [(25/D)^1.5]

Approach to Analysis – Operations

Operation and Maintenance

Under the No Action Alternatives, no new activities would occur under Phase 2 and the pond clusters would continue to be monitored and managed through the activities described in the Adaptive Management Plan (AMP) and in accordance with current United States Fish and Wildlife Service (USFWS) practices for management of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). The existing breached levees would continue to be scoured from hydraulic action and naturally degrade. Some levees would continue to be maintained and repaired as needed to prevent unplanned breaches and provide flood protection. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be the principal component of the continued implementation of the AMP at these pond clusters. Additional details regarding the implementation of the AMP are described in the 2007 EIS/R.

Long-Term Operations

The project area would be open space, consisting of tidal habitat/managed ponds and passive recreational facilities. New recreational facilities would be constructed for all Action Alternatives, except those associated with the Island Ponds. Under the Action Alternatives, the pond complexes would include recreational facilities that permit walking/hiking/biking, birdwatching, kayaking, viewing wildlife and wetlands, and learning about the history and uses of the area. No active recreational uses (e.g., ball fields) would be constructed. The anticipated noise levels generated by the passive recreational uses would not substantially alter the ambient noise environment, especially in areas where recreation already exists within the pond complexes or is adjacent to the pond complexes. The low and occasional noise levels generated by recreational users would not be noticeable from off-site locations, especially in relation to the distance from sensitive receptors (in almost all cases in Phase 2, industrial uses separate the open-space uses and residential uses). Noise generated by area roadways and highways, railroads, and overflights, the dominant noise source in the area, would in some cases be much higher than any noise generated from passive recreational users.

Significance Criteria

For the purposes of this Final EIS/R, a significant noise impact would occur if the project resulted in the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plans or noise ordinances or the applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity due to construction activities; or
- Exposure of people residing or working in the project area to excessive aircraft-generated noise levels.

The quantitative noise standards depend on the jurisdictions where activities would occur (see Section 3.12.2, Regulatory Setting), and are discussed below in relation to the SBSP Restoration Project.

The SBSP Restoration Project would not expose people residing in (though no habitable structures exist within the project area) or near or working in the Phase 2 project area to excessive aircraft-generated noise levels, because no habitable structures would be located within the pond complexes, and the Phase 2 project area is not in an area with excessive aircraft-generated noise levels. Therefore, this significance criterion is not assessed in the project-level evaluation below.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-2, which ensures that contractors use routes that require trucks to avoid residential areas for haul routes.

As explained in Section 3.1.2, Environmental Setting and Impact Analysis, even though both the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA and the California Environmental Quality Act (CEQA) Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Section 3.1.2 describes the terminology used to explain the severity of the impacts.

Program-Level Evaluation

The 2007 EIS/R conducted broad, regional analyses of program-level noise impacts from the types of activities that would be necessary to implement Programmatic Alternative A (the No Action Alternative) and Programmatic Alternatives B and C (the two program-level Action Alternatives). The 2007 EIS/R evaluated the potential noise and vibration impacts of three long-term alternatives, which were each determined to have less than significant impacts to persons, ambient noise levels, and the established standards of local plans. The 2007 EIS/R found that under each programmatic alternative, noise impacts from construction activities, traffic, water pumping, and O&M activities would be less than significant with mitigation incorporated. Furthermore, the 2007 EIS/R found that none of the long-term alternatives would result in vibration levels in excess of the Caltrans or FTA standards.

Project-Level Evaluation

Phase 2 Impact 3.12-1: Short-term construction noise effects.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, the No Action Alternative, no new construction would occur under Phase 2 and the pond cluster would continue to be monitored and managed through the activities described in the AMP in accordance with current USFWS practices. As such, no short-term construction noise impacts would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Implementation of Alternative Island B would involve construction and earthmoving activities, including lowering the levees along the north and south perimeter of Pond A19 and removing the existing levees that currently separate Ponds A19 and A20. Alternative Island B would also create two new breaches along the north side of Pond A19, creating additional connection with Mud Slough. Construction could be accomplished using excavators, a barge (for fueling and possibly access to the project site), a low-bed truck, other common construction equipment, a skiff, and pickup vehicles for transportation in and out of the project site.

As shown in Table 3.12-3, the exterior noise levels caused by short-term use of the construction equipment listed referred to in Table 3.12-3 and as experienced by the closest residence would be 57 dBA (L_{eq}), and noise levels would further decrease as the distance between construction activities and sensitive receptors increases. This noise level would not exceed the City of Fremont noise ordinance Article 19, Section 8-21904, which states that for land uses within the city, the maximum noise generated by such use cannot exceed 60 dBA when adjacent uses are residential, park, or institutional uses. Less-stringent standards apply to adjacent commercial or industrial uses (65 to 70 dBA, respectively). There are no parks, schools, churches, or hospital or health-care facilities within 1 mile of the cluster.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or noise levels designated for the City of Fremont and the County of Alameda where the work activities would occur. Therefore, construction activities will not occur during noise-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would include all of the components of Alternative Island B with the addition of three components: levee breaches on the north sides of ponds A20 and A21, pilot channels in Pond A19, and the widening of the existing breaches on the southern levee of Pond A19. Construction could be accomplished using excavators, a barge (for fueling and possibly access to the project site), a low-bed truck, other construction equipment, a skiff, and pickup vehicles for transportation in and out of the project site.

Therefore, implementation of Alternative: Island C would result in similar noise impacts as Alternative Island B (57 dBA [L_{eq}], as experienced by the nearest sensitive receptor) because construction activities would involve the same equipment and construction would occur generally in the same locations relative to the nearby sensitive receptors. This noise level would not exceed City of Fremont noise ordinance Article 19, Section 8-21904, which states that for land uses within the city, the maximum noise generated by such use cannot exceed 60 dBA when adjacent uses are residential, park, or institutional uses. Less stringent standards apply to adjacent commercial or industrial uses (65 to 70 dBA, respectively).

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which ensures that construction activities will be limited to the days and hours or noise levels designated for the City of Fremont and the County of Alameda, where the work activities would occur. Therefore, construction activities will not occur during noise-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge and the AMP. The pond cluster would continue to be managed through the activities described in the AMP in accordance with current USFWS practices. Under Alternative Mountain View A, no construction activities would occur within the Mountain View pond cluster. As such, no short-term construction noise impacts would occur.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Alternative Mountain View B would breach levees at several locations along the perimeter levees of Ponds A1 and A2W. Alternative Mountain View B would also raise the levee between Charleston Slough and Pond A1 and construct habitat transition zones on the south sides of Ponds A1 and A2W. Alternative Mountain View B would also raise the west levee of Pond A1 and construct several islands within Ponds A1 and A2W. PG&E would raise existing boardwalks, add a new length of boardwalk, and pour newer and higher concrete foundations around each tower footing. Recreational components such as interpretive platforms, viewing platforms, and several trails would also be improved.

The armoring and bridging of breaches on the east levee of Pond A2W would be done in the dry. Armoring and bridging the breaches on the east levee of Pond A2W would require dewatering activities. Cofferdams would be installed at the breach and bridge locations to facilitate the construction of concrete abutments and wingwalls. Cofferdams would also be built for dewatering around each PG&E tower footing so that a newer and higher concrete footing can be added to each footing. Construction would be accomplished using excavators, bulldozers, dump trucks, a compaction roller, a water tanker, refueling tanks, pile driving equipment, pumps, cranes, a portable barge, skiffs, paving equipment, and pickup vehicles for transportation in and out of the project site.

An assessment of nearby sensitive residential land uses of 3,400 feet (Ponds A1), 6,700 feet (Ponds A2W) and 3,400 feet (Charleston Slough) (see Table 3.12-2, column 2) indicated that the exterior noise levels at noise-sensitive receptors would be 66, 60, and 66 dBA (L_{eq}), respectively (see Table 3.12-3) and noise levels would further decrease as the distance from the receptors increases. These noise levels would not exceed the City of Mountain View standards, which generally provide that noise levels over 70 L_{dn} are unacceptable.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or noise levels designated for the City of Mountain View, where the work activities would occur. Therefore, construction activities will not occur during noise-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which limits the hours trucks may deliver fill and requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C would breach levees and lower levee heights to increase tidal flows in Pond A1, Pond A2W, and Charleston Slough and add recreation opportunities. Other modifications would include adding habitat transitions zones and islands. Flood control would be maintained with improvements to the southern and western levees of Charleston Slough. A new primary water intake for Mountain View's sailing lake would be constructed at the breach between Pond A1 and Charleston Slough. PG&E would raise existing boardwalks, add a new length of boardwalk, and pour newer, higher concrete foundations around each tower footing. Several new trails, viewing platforms, and interpretative platforms would be installed or replaced to improve recreation and public access at the pond cluster. Upland fill material could be imported into the ponds to raise levees, construct islands, or build habitat transition zones.

Implementation of Alternative Mountain View C would result in similar noise impacts as Alternative Mountain View B (66, 60, and 66 dBA [Leq]), respectively, for Pond A1, Pond A2W, and Charleston Slough, as experienced by the nearest sensitive receptor, because construction activities would involve the same equipment and construction would occur generally in the same locations relative to the nearby sensitive receptors. This noise level would not exceed the City of Mountain View noise standard, which generally provides that noise levels over 70 L_{dn} are unacceptable. As such, the short-term impacts from use of construction equipment for Alternative Mountain View C would be less than significant.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or noise levels designated for the City of Mountain View, where the work activities would occur. Therefore, construction activities will not occur during noise-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (No Action), no upland fill material would be added to the pond bottoms or the border levees of either Pond A8 or Pond A8S. The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. The Phase 2 No Action Alternative for the A8 Ponds would not require construction activities within the ponds. As such, no short-term construction noise impacts would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Implementation of Alternative A8 B would construct habitat transition zones in the southwest and southeast corners of Pond A8S. Construction equipment to accomplish this action would include haul trucks, bulldozers, water trucks, compaction rollers, other construction equipment, and vehicles for transportation in and out of the project site.

An assessment of nearby sensitive land uses of 2,100 feet (Pond A8) and 1,700 feet (Pond A8S) (see Table 3.12-3, column 2) indicated that exterior noise levels at noise-sensitive receptors would be 70 and 72 dBA (L_{eq}), respectively (see Table 3.12-3). Noise levels would decrease as the distance from the receptors increases.

These noise levels would not exceed Santa Clara County or City of Sunnyvale noise standards, which limit noise levels as experienced by sensitive receptors during nighttime hours. Chapter 20 of the City of San Jose Municipal Code provides exterior noise standards for specific land use districts. Noise level standards vary from a maximum noise level of 55 dBA (e.g., residential) to 70 dBA (e.g., industrial or open space next to industrial uses). The closest residence is at least 1,700 feet away from the construction areas at the A8 Ponds, so the construction noise levels will be below that threshold. Several businesses and open-space uses are closer than 500 feet away, so the 70 dBA limit from the San Jose Municipal Code may be approached. If a conditional use permit is required from the city to address periodic exceedances of the lists, one will be obtained.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1, which requires that construction activities be limited to the days and hours or noise levels designated for the City of San Jose, where the work activities would occur. All construction equipment staging areas would be located at the furthest distance possible from nearby noise-sensitive land uses, and construction equipment would be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Refuge system and the AMP. As such, Alternative Ravenswood A would not require construction activities within the ponds. As such, no impacts from short-term construction noise would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Alternative Ravenswood B would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create a habitat transition zone along the western edge of Pond R4, establish managed ponds to improve habitat for diving and dabbling birds, increase pond connectivity, and improve recreation and access. Ponds R5 and S5, which are currently seasonal managed ponds, would be converted into enhanced managed ponds through the construction of water control structures, removal or modification of levees within and between the ponds, creation of islands, and specific operational techniques. A water control structure would be installed on Pond R3 to enhance it for western snowy plover habitat Construction could be accomplished using excavators, bulldozers, amphibious equipment such as an aquatic excavator, dump trucks, compaction rollers or vibratory plates, a water tanker, refueling tanks, and pickup vehicles for transportation in and out of the project site.

An assessment of nearby sensitive land uses of 1,000 feet (Pond R3), 2,800 feet (Pond R4), 2,400 feet (Pond R3), and 1,600 feet (Pond S5) (see Table 3.12-3, column 2), exterior noise levels at noise-sensitive receptors would be 77, 68, 69, and 72 dBA (L_{eq}), respectively (see Table 3.12-3). Noise levels would decrease as the distance from the receptors increases. These noise levels would not exceed the County of San Mateo Chapter 4.88 Noise Ordinance standards or the City of Menlo Park Municipal Code, which limits noise levels as experienced by sensitive receptors during certain hours.[1]

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or noise levels designated for the City of Menlo Park, where the work activities would occur. Therefore, construction activities would not occur during noise-sensitive hours. The project is also committed to implementation

1 Per 2007 EIS/R Mitigation Measure 3.13-1.

of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C would be similar to Alternative Ravenswood B with the following exceptions: Ponds R5 and S5 would be converted to a particular type of managed pond; water control structures would be installed on Pond R3 to enhance it for western snowy plover habitat; an additional habitat transition zone would be constructed; and additional recreational and public access components would be constructed. Construction could be accomplished using excavators, bulldozers, amphibious equipment such as an aquatic excavator, dump trucks, compaction rollers or vibratory plates, a water tanker, refueling tanks, and pickup vehicles for transportation in and out of the project site.

Overall, the implementation of Alternative Ravenswood C would result in similar short-term construction noise impacts as Alternative Ravenswood B because construction activities would involve the same equipment and construction would occur generally in the same locations relative to the nearby sensitive receptors. Noise levels would not exceed the County of San Mateo Chapter 4.88 Noise Ordinance standards or the City of Menlo Park Municipal Code, which limits noise levels as experienced by sensitive receptors during certain hours.[2]

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1, which requires that construction activities be limited to the days and hours or noise levels designated for the City of Menlo Park, where the work activities would occur. Therefore, construction activities would not occur during noise-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D would open Pond R4 to tidal flows, improve levees to provide additional flood protection, create two habitat transition zones in Pond R4, establish enhanced managed ponds in Ponds R5 and S5 to improve habitat for diving and dabbling birds, increase pond connectivity, enhance Pond R3 for western snowy plover habitat, allow stormwater outflow from Redwood City to Ponds R5 and S5, remove the levees within and between Ponds R5 and S5, and improve recreation and public access. Construction could be accomplished using excavators, bulldozers, amphibious equipment such as an aquatic excavator, dump trucks, compaction rollers or vibratory plates, a water tanker, refueling tanks, and pickup vehicles for transportation in and out of the project site.

Implementation of Alternative Ravenswood D would result in similar noise impacts as Alternative Ravenswood B because construction activities would involve the same equipment and construction would occur generally in the same locations relative to the nearby sensitive receptors.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or noise levels designated for the City of Menlo Park, where the work activities would occur. Therefore, construction activities would not occur during noise-sensitive hours. The project is also committed to implementation

[2] Per 2007 EIS/R Mitigation Measure 3.13-1.

of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, noise impacts from short-term construction activities would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.12-2: Traffic-related noise impacts during construction.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, the No Action Alternative, no new construction would occur under Phase 2 and the pond cluster would continue to be monitored and managed through the activities described in the AMP in accordance with current USFWS practices. As such, no short-term construction noise impacts would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Construction activities would require the transport of equipment to and from the pond cluster. No material would need to be moved on- or off-site for the construction of this alternative. Short-term construction traffic would consist of the transportation of the worker crew, which would consist of three to five people per day, and other construction truck trips delivering small equipment. The transport of equipment at the beginning and end of the construction seasons would occur by accessing the ponds on barges from the Bay water side, either through Mud Slough or Coyote Creek. Vehicle trips would be spread over the construction period, which would likely be completed in 16 months over two or three construction seasons.

Typically, an increase in noise levels is perceptible (3 dBA [CNEL/ L_{dn}]) when traffic volumes double along an affected roadway segment. Access to each site for daily work crews is provided via local roadways as described in Section 3.11, Traffic. These routes would occur primarily along highways and through industrial and commercial uses. Per SBSP Mitigation Measure 3.13-2, trucks are required to avoid residential areas where sensitive receptors are located and, as such, impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Construction of Alternative Island C would be similar to that of Alternative Island B. As with Alternative Island B, short-term construction traffic would consist of the transportation of the worker crew, which would consist of three to five people per day, and other construction truck trips delivering small equipment. The transport of equipment at the beginning and end of construction seasons would occur by accessing the ponds on barges from the Bay water side, either through Mud Slough or Coyote Creek. Vehicle trips would be spread over the construction period, which would likely be completed in 19 months over two or three construction seasons. Per SBSP Mitigation Measure 3.13-2, trucks are required to avoid residential areas where sensitive receptors are located, and as such, impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Refuge system and the AMP. The pond cluster would continue to be managed through the activities described in the AMP in accordance with current USFWS practices. Under Mountain View Alternative A, no construction activities would occur within the Mountain View pond cluster. As such, no short-term construction noise impacts would occur.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Construction of Alternative Mountain View B would require the transport of equipment and the generation of truck trips associated with the delivery of equipment at the beginning and end of the construction period, daily worker vehicles, and from the long-term delivery of as much as 296,400 cy of upland fill, requiring 200 daily trips by trucks carrying 11 cy each. Truck trips for the delivery of fill would be concentrated in the shortest duration (in months) possible, which would likely require a total of approximately 6.1 months over portions of three construction seasons.

Typically, an increase in noise levels is perceptible (3 dBA [CNEL/ L_{dn}]) when traffic volumes double along an affected roadway segment. Access to each pond cluster is provided via local roadways, as described in Section 3.11, Traffic. These haul routes would occur primarily along highways and through industrial and commercial uses. Per SBSP Mitigation Measure 3.13-2, trucks would be required to avoid residential areas.

Short-term construction traffic would consist of the transportation of the worker crew, which would consist of five to 10 people per day, and other construction truck trips delivering equipment and materials.

A large volume of traffic travels on U.S. 101 and major arterials like San Antonio Road, which currently handles 897 northbound (NB) trips and 256 southbound (SB) trips in the a.m. peak hour and 486 NB trips and 1,035 SB trips in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. A large volume of traffic also goes into and out of Shoreline Park and the numerous business parks in this portion of Mountain View (including those for Google, LinkedIn, and other businesses with large and expanding campuses and numerous employees). Relative to these large volumes of traffic, the total number of crew trucks and a maximum of 20 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Construction of Alternative Mountain View C would be similar to that of Alternative Mountain View B, but with an estimated delivery of 369,600 cy of upland fill, requiring 200 daily trips by trucks carrying 11 cy each. As with Alternative Island B, short-term construction traffic would consist of the transportation of the worker crew, which would consist of five to 10 people per day, and other construction truck trips delivering equipment and materials. Truck trips for the delivery of fill would be concentrated in the shortest duration (in months) possible, which would likely require a total of approximately 7.6 months over portions of three construction seasons. Per SBSP Mitigation Measure 3.13-2, trucks would be required to avoid residential areas.

A large volume of traffic travels on U.S. 101 and major arterials like San Antonio Road, which currently handles 897 NB trips and 256 SB trips in the a.m. peak hour and 486 NB trips and 1,035 SB trips in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. A large volume of traffic also goes into and out of Shoreline Park and the numerous business parks in this portion of Mountain View (including those for Google, LinkedIn, and other businesses with large and expanding campuses and numerous employees). Relative to these large volumes of traffic, the total number of crew trucks and a maximum of 20 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (No Action), no upland fill material would be added to the pond bottoms or the border levees of either Pond A8 or Pond A8S. The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. The Phase 2 No Action Alternative for the A8 Ponds would not require construction activities within the ponds. As such, no short-term construction noise impacts would occur.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Construction of Alternative A8 B would require an estimated delivery of 190,000 cy of fill material necessary to construct the habitat transition zones. This would require 180 trips per day for 96 days by trucks carrying 11 cy each. As with the other pond clusters, short-term construction traffic would consist of the transportation of the worker crew, which would consist of three to five people per day, and other construction truck trips delivering equipment and materials. Truck trips for the delivery of fill would be concentrated in the shortest duration (in months) possible, which would likely be approximately 4-5 months. Per SBSP Mitigation Measure 3.13-2, trucks would be required to avoid residential areas.

A large volume of traffic travels of SR 237 and arterials like Great American Parkway, which currently handles 418 NB trips and 471 SB trips in the a.m. peak hour and 721 NB trips and 1,149 SB in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. A large volume of traffic also uses Gold Street to go into and out of the Alviso community. Relative to these large volumes of traffic, the total number of crew trucks and a maximum of 18 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, no new activities would be implemented as part of Phase 2. The USFWS is maintaining the ponds as part of the Refuge system and the AMP. As such, Alternative Ravenswood A would not require construction activities within the ponds. As such, no impacts from short-term construction noise would occur.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Construction of Ravenswood Alternative B could require an estimated delivery of 37,900 cy of fill in the form of appropriate upland material to be imported and used in Ponds R4, R5, or S5 to enhance levees or build the habitat transition zones, requiring 150 daily trips by trucks carrying 11 cy each.

As with the other pond clusters, short-term construction traffic would consist of the transportation of the worker crew, which would consist of five to 10 people per day, and other construction truck trips delivering equipment and materials. Truck trips for the delivery of fill would be concentrated in the shortest duration (in months) possible, which would likely be approximately 1 month. Per SBSP Mitigation Measure 3.13-2, trucks would be required to avoid residential areas.

A large volume of traffic travels on SR 84/Marsh Road, which currently handles 1,761 NB trips and 2,884 SB trips in the a.m. peak hour and 1,779 NB trips and 2,354 SB trips in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. This route will provide direct access to the project site for construction-related vehicles. Relative to this large volume of traffic, the total number of crew trucks and a maximum of 15 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Construction of Alternative Ravenswood C would be similar to that of Alternative Ravenswood B. Construction of Alternative Ravenswood C could require an estimated delivery of 210,400 cy of fill in the form of appropriate fill material, requiring 150 daily trips by trucks carrying 11 cy each.

As with the other pond clusters, short-term construction traffic would consist of the transportation of the worker crew, which would consist of five to 10 people per day, and other construction truck trips delivering equipment and materials. Truck trips for the delivery of fill would be concentrated in the shortest duration (in months) possible, which would likely be approximately 5.8 months. Per SBSP Mitigation Measure 3.13-2, trucks would be required to avoid residential areas and delivery of material would be limited to daytime hours only.

A large volume of traffic travels on SR 84/Marsh Road, which currently handles 1,761 NB trips and 2,884 SB trips in the a.m. peak hour and 1,779 NB trips and 2,354 SB trips in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. This route will provide direct access to the project site for construction-related vehicles. Relative to this large volume of traffic, the total number of crew trucks and a maximum of 15 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Construction activities would require the transport of equipment to and from the pond cluster. Short-term construction traffic would consist of the transportation of the worker crew, which would consist of five to 10 people per day, and other construction truck trips delivering equipment and materials. Truck trips would be associated with the delivery of equipment at the beginning and the end of the construction period and daily worker vehicles. No net import of fill material would be needed.

A large volume of traffic travels on SR 84/Marsh Road, which currently handles 1,761 NB trips and 2,884 SB trips in the a.m. peak hour and 1,779 NB trips and 2,354 SB trips in the p.m. peak hour per Appendix G, Traffic Impact Study for South Bay Salt Pond Restoration – Phase 2 Project. This route will provide direct access to the project site for construction-related vehicles. Relative to this large traffic volume, the total number of crew trucks and a maximum of 15 fill-delivery trucks per hour is not expected to cause a substantial increase in the vehicle-related noise in the area.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.12-3: Traffic-related noise effects during operation.

Alviso-Island Ponds

Alternative Island A (No Action). Under this alternative, limited O&M activities would occur. The pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be the principal component of the continued implementation of the AMP at this pond cluster. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. The increase in traffic associated with O&M activities would be minimal (see SBSP Phase 2 Impact 3.11-2, in Section 3.11, Traffic) and is not expected to increase to a level that would generate traffic-related noise. Furthermore, O&M traffic is expected to be primarily passenger vehicles rather than heavy-duty trucks, as would be required for construction activities. As such, impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by the 1995 United States Army Corps of Engineers (USACE) permit #19009S98, applicable county operations, and the AMP. The Union Pacific Railroad would continue to operate and maintain its infrastructure; these activities would occur in coordination with the Refuge managers to ensure consistency with the O&M for the pond cluster.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. AMP monitoring activities would also occur and could require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). However, the number of trips to the Island Ponds for maintenance is not expected to increase over the baseline by more than a few trips per week.

Intermittent traffic noise associated with Alternative Island B activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what occurs now under existing conditions or would occur under Alternative Island A (No Action) and because trips would occur during daytime hours.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The O&M activities at this pond cluster under this alternative would be the same as those under Alternative Island B. No additional or different activities would occur to operate or maintain these ponds under this alternative.

Intermittent traffic noise associated with Alternative Island C activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what occurs now under existing conditions or would occur under Alternative Island A (No Action) and because trips would occur during daytime hours.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, limited O&M activities would occur and existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained and used. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. The increase in traffic associated with O&M and recreation activities would be minimal (see SBSP Phase 2 Impact 3.11-2, in Section 3.11, Traffic) and is not expected to increase to a level that would generate traffic-related noise. Furthermore, O&M traffic is expected to be primarily passenger vehicles rather than heavy-duty trucks, as would be required for construction activities. As such, impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by 1995 USACE Permit #19009S98, applicable County operations, and the AMP. PG&E would continue to operate and maintain its infrastructure, which would occur in coordination with the Refuge managers to ensure consistency with the O&M activities for the pond cluster. The City of Mountain View would continue to operate and maintain its properties that are a part of the pond cluster, which would also occur in coordination with the Refuge managers.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Improved levees would be inspected and maintained for slope stability, erosion control, seepage, slides, and settlement on an annual basis. Maintenance is expected every 5 years to add additional fill material in areas where settlement occurs. AMP monitoring activities would also occur; these activities would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). Visits could include maintenance of habitat transition zones, flood control levees, and recreational facilities as needed over time.

Intermittent traffic noise associated with Alternative Mountain View B activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what occurs now under existing conditions or what would occur over time under Alternative Mountain View A (No Action) and because trips would occur during daytime hours.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. The O&M activities at this pond cluster under this alternative would be similar in nature to those in Alternative Mountain View B. However, some of those maintenance activities would occur in different places (e.g., on the west levee of Charleston Slough instead of on the west levee of Pond A1) or over a larger or smaller area (e.g., Alternative C has more trails to maintain and fewer square feet of habitat transition zones). There would be a slight increase in the number of maintenance trips to the Mountain View ponds because of the greater number of public access facilities and the additional water intake system for the Shoreline Park sailing lake, but these would generally be intermittent visits by passenger vehicles and pickup trucks.

Intermittent traffic noise associated with Alternative Mountain View C activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what occurs now under existing conditions or what would occur over time under Alternative Mountain View A (No Action) and because trips would occur during daytime hours.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. The increase in traffic associated with O&M activities would be minimal (see SBSP Phase 2 Impact 3.11-2, in Section 3.11, Traffic) and is not expected to increase to a level that would generate traffic-related noise. Furthermore, O&M traffic is expected to be primarily passenger vehicles rather than heavy-duty trucks, as would be required for construction activities. As such, impacts would be less than significant.

Alternative A8 A Level of Significance: Less than significant.

Alternative A8 B. The USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. The Santa Clara Valley Water District (SCVWD) would also be involved in maintaining these ponds. These ongoing management practices would not change during or after the construction activities described above. Refer to pages 2-120 through 2-132 of the 2007 EIS/R for additional details.

Intermittent traffic noise associated with Alternative A8 B activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what occurs now under existing conditions or what would occur under Alternative A8 A (No Action) and because trips would occur during daytime hours.

Alternative A8 B Level of Significance: Less than significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. The increase in traffic associated with O&M activities would be minimal (see SBSP Phase 2 Impact 3.11-2, in Section 3.11, Traffic) and is not expected to increase to a level that would generate traffic-related noise. Furthermore, O&M traffic is expected to be primarily passenger vehicles rather than heavy-duty trucks, as would be required for construction activities. As such, impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by 1995 USACE permit #19009S98, applicable county operations, and the AMP. PG&E would continue to operate and maintain its infrastructure, which would occur in coordination with the Refuge managers to ensure consistency with the O&M activities at the pond cluster. The City of Menlo Park would continue to operate and maintain its properties that are adjacent to the pond cluster; these activities would also occur in coordination with the Refuge managers.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. AMP monitoring activities would also occur; these activities would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). These activities could include maintenance of habitat transition zones, flood control levees, and recreational facilities as needed over time.

Intermittent traffic noise associated with Alternative Ravenswood B activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what would occur now under existing conditions or what would occur over time under Alternative Ravenswood A (No Action) and because trips would occur during daytime hours.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The O&M activities at this pond cluster under this alternative would be the same as those for Alternative Island B. No additional or different activities would occur to operate or maintain these ponds under this alternative.

Intermittent traffic noise associated with Alternative Ravenswood C activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what would occur now under existing conditions or what would occur over time under Alternative Ravenswood A (No Action) and because trips would occur during daytime hours.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The O&M activities at this pond cluster under this alternative would be similar to those under Alternative Island B. The only additional or different activities to operate or maintain these ponds under this alternative would be associated with the cleaning and maintenance of the pipes and ditch for the Bayfront Canal and Atherton Channel. These will require periodic cleaning (e.g., trash removal) and inspections for maintenance; generally, these activities would consist of a single vehicle for staff to drive to the site. This alternative would not dramatically increase traffic to the site or the overall noise associated with traffic.

Intermittent traffic noise associated with Alternative Ravenswood D activities would be less than significant based on the relatively small increase in daily vehicle traffic in comparison to what would occur now under existing conditions or what would occur over time under Alternative Ravenswood A (No Action) and because trips would occur during daytime hours.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.12-4: Potential operational noise effects from O&M activities.

Alviso-Island Ponds

Alternative Island A (No Action). Under this alternative, limited O&M activities would occur. The pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be the principal component of the continued implementation of the AMP at this pond cluster. Alternative Island A (No Action) activities would require limited O&M activities that would generate noise. However, because O&M activities would occur during daytime, non-noise-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, noise effects would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Under Alternative Island B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by 1995 USACE permit #19009S98, applicable county operations, and the AMP. The Union Pacific Railroad would continue to operate and maintain its infrastructure, which would occur in coordination with the Refuge managers to ensure the consistency of the O&M activities at the pond cluster.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. AMP monitoring activities would also occur and could require additional workers (e.g., staff, consultants) to access the pond cluster. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). However, the number of trips to the Island Ponds for maintenance is not expected to increase over the baseline by more than a few trips per week.

Intermittent O&M activities associated with Alternative Island B, such as predator control, general vegetation control, and vandalism repairs, would not significantly increase noise levels to greater levels than currently occur under existing conditions or what would occur over time under Alternative Island A (No Action).Therefore, operation noise impacts would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The O&M activities at this pond cluster under this alternative would be the same as those under Alternative Island B. No additional or different activities would occur to operate or maintain these ponds under this alternative.

Intermittent O&M activities associated with Alternative Island C, such as predator control, general vegetation control, and vandalism repairs, would not significantly increase noise levels to greater levels than currently occur now under existing conditions or what would occur over time under Alternative Island A (No Action).Therefore, operation noise impacts would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, limited O&M activities would occur and existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained and used. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative Mountain View A (No Action) activities would require limited O&M activities that would generate noise. However, because O&M activities would occur during daytime, non-noise-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, noise effects would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by 1995 USACE permit #19009S98, applicable county operations, and the AMP. PG&E would continue to operate and maintain its infrastructure; these activities would occur in coordination with the Refuge managers to ensure the consistency of the O&M activities for the pond cluster. The City of Mountain View would continue to operate and maintain its properties that are a part of the pond cluster, and these activities would occur in coordination with the Refuge managers.

Periodic maintenance of the infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Improved levees would be inspected and maintained for slope stability, erosion control, seepage, slides, and settlement on an annual basis. Maintenance is expected every 5 years to add additional fill material in areas where settlement occurs. AMP monitoring activities would also occur and could require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). Trails and interpretive platforms would be regularly maintained and would be used for recreational purposes.

The intermittent O&M activities associated with Alternative Mountain View B would not significantly increase noise levels to levels greater than those that currently occur under existing conditions or what would occur over time under Alternative Mountain View A (No Action). Noise effects from operation of recreational facilities would be less than significant, as the low and occasional noise levels generated by recreational users would not be noticeable from off-site locations and such noises would be limited to the daytime hours when recreational facilities are open to the public. As such, impacts would be less than significant. Therefore operation noise impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. The O&M activities at this pond cluster under this alternative would be similar to those under Alternative Mountain View B. However, some of those maintenance activities would occur in different places (e.g., on the western levee of Charleston Slough instead of on the western levee of Pond A1) or over a larger or smaller area (e.g., Alternative C has more trails to maintain and fewer square feet of habitat transition zones).

The intermittent O&M activities associated with Alternative Mountain View C would not significantly increase noise levels to levels greater than those that currently occur under existing conditions or what would occur over time under Alternative Mountain View A (No Action), although activities may occur more frequently. Noise effects from operation of recreational facilities would be less than significant, as the low and occasional noise levels generated by recreational users would not be noticeable from off-site locations and such noises would be limited to the daytime hours when recreational facilities are open to the public. As such, impacts would be less than significant. Therefore, operation noise impacts would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative A8 A (No Action) activities would require limited O&M activities that would generate noise. However, because O&M activities would occur during daytime, non-noise-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, noise effects would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, the USFWS would continue to operate and maintain the ponds in accordance with the AMP and other ongoing management practices that have been in place since the implementation of Phase 1 actions. These management practices include the wet season management of tidal exchange between Pond A8 and Alviso Slough to avoid fish trapping and to maintain existing levels of flood protection; inspections of pond infrastructure to ensure the pond is operating as intended, achieving tidal connectivity as intended and meeting water quality requirements; monitoring of restoration performance; and summer water level recording.

The intermittent O&M activities associated with Alternative A8 B would not significantly increase noise levels to greater levels than currently occur under existing conditions or what would occur over time under Alternative A8 A (No Action).Therefore, operation noise impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative Ravenswood A (No Action) activities would require limited O&M activities that would generate noise. However, because O&M activities would occur during daytime, non-noise sensitive-hours only, and because such activities would occur intermittently within the 50-year planning period, noise effects would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, O&M activities for components of the pond cluster within the Refuge would continue to follow and be determined by 1995 USACE permit #19009S98, applicable county operations, and the AMP. PG&E would continue to operate and maintain its nearby infrastructure; these activities would occur in coordination with the Refuge managers to ensure the consistency of the O&M activities for the pond cluster. The City of Menlo Park would continue to operate and maintain its properties that are adjacent to the pond cluster, and these activities would occur in coordination with the Refuge managers.

Periodic maintenance of the pond infrastructure would be required following construction. Maintenance would require approximately one maintenance staff person to travel to the pond cluster one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Water control structures would require inspection for structural integrity of gates, pipes, and approach way; obstruction to flow passage; and preventative maintenance such as visual functionality of gates, seals, and removal of debris. Inspection would be required every month during the first year and semi-annually thereafter. Maintenance would be required on an annual basis. AMP monitoring activities would also occur and would require additional workers (e.g., staff, consultants) to access the pond clusters. The frequency of visits to the pond cluster to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season there could be more trips to the site than during the non-breeding season). These activities could include operating water control structures and providing maintenance of habitat transition zones, flood control levees, and recreational facilities as needed over time.

The intermittent O&M activities associated with Alternative Ravenswood B would not significantly increase noise levels to levels greater than those that currently occur under existing conditions or would occur over time under Alternative Ravenswood A (No Action), although activities may occur more frequently. Noise effects of operation of recreational facilities would be less than significant, as the low and occasional noise levels generated by recreational users would not be noticeable from off-site locations and such noises would be limited to the daytime hours when recreational facilities are open to the public. As such, impacts would be less than significant. Therefore, operation noise impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The O&M activities at this pond cluster under this alternative would be similar to those under Alternative Ravenswood B. No additional or different activities would occur to operate or maintain these ponds under this alternative.

The intermittent O&M activities associated with Alternative Ravenswood C would not significantly increase noise levels to levels greater than those that currently occur under existing conditions or would occur over time under Alternative Ravenswood A (No Action), although activities may occur more frequently. Noise effects of operation of recreational facilities would be less than significant, as the low and occasional noise levels generated by recreational users would not be noticeable from off-site locations and such noises would be limited to the daytime hours when recreational facilities are open to the public. As such, impacts would be less than significant. Therefore, operation noise impacts would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The O&M activities at this pond cluster under this alternative would be similar to those under Alternative Ravenswood B. The only additional or different activities to operate or maintain these ponds under this alternative would be associated with the cleaning and maintenance of the pipes and ditch for the Bayfront Canal and Atherton Channel. These activities would require periodic cleaning (e.g., trash removal) and inspections for maintenance, which would generally involve a single vehicle for staff to drive to the site. This activity would not dramatically increase noise associated with maintenance.

The intermittent O&M activities associated with Alternative Ravenswood D would not significantly increase noise levels to levels greater than those that currently occur under existing conditions or would occur over time under Alternative Ravenswood A (No Action), although activities may occur more frequently. Noise effects of operation of recreational facilities would be less than significant, as the low and occasional noise levels generated by recreational users would not be noticeable from off-site locations and such noises would be limited to the daytime hours when recreational facilities are open to the public. As such, impacts would be less than significant. Therefore, operation noise impacts would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.12-5: Potential vibration effects during construction and/or operation.

Alviso-Island Ponds

Alternative Island A (No Action). Under this alternative, no new construction activities and limited O&M activities would occur. The pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Ongoing monitoring and studies to track the progress of these ponds toward restoration as tidal marsh would be the principal component of the continued implementation of the AMP at this pond cluster. Alternative Island A (No Action) activities would require limited O&M activities that would generate vibration. However, because O&M activities would occur during daytime, non-vibration-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, vibration effects during construction and/or operation would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Construction activities under this alternative have the potential to result in varying degrees of temporary groundborne vibration. Construction and operation of Ponds A19, A20, and A21 under Alternative B would not require the use of piledriving. However, construction of Alternative Island B would include use of excavators. The nearest sensitive receptor to construction equipment generating vibration is 10,000 feet. Using FTA's recommended procedure, with a predicted worst-case vibration level at approximately 10,000 feet would be approximately 0.00001 in/sec PPV and 9.7 VdB for operation of an excavator. As the distance of construction activities increases, the levels would decrease from those estimated above. From the calculated values, operation of Alternative Island B would not exceed the Caltrans recommended standard of 0.2 in/sec PPV and would not exceed the FTA's maximum-acceptable vibration standard of 80 VdB.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or vibration levels designated for the City of Fremont and the County of Alameda, where the work activities would occur. Therefore, construction activities would not occur during vibration-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which would require trucks to avoid residential areas for haul routes. Therefore, vibration impacts from short-term construction activities would be less than significant.

O&M activities within Ponds A19, A20, and A21 under Alternative Island B would not require the use of piledrivers or other heavy construction equipment that could potentially generate significant impacts from vibration. As such, vibration impacts resulting from O&M activities occurring under Alternative Island B would not be significantly greater than those occurring under Alternative Island A (No Action).

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Operation and construction of Alternative Island C would be similar to that defined for Alternative Island B above. As such, potential noise impacts from construction and operation would be less than significant.

Alternative C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, limited O&M activities would occur and existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained and used. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative Mountain View A (No Action) activities would require limited O&M activities that would generate vibration. However, because O&M activities would occur during daytime, non-vibration-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, vibration effects during construction and/or operation would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Construction activities under this alternative have the potential to result in varying degrees of temporary groundborne vibration. Construction of Alternative Mountain View B would require the use of piledrivers within Pond A2W for the construction of rail boxcar bridges that would span across the two breaches along the Pond A2W eastern levee. The nearest sensitive receptor to the piledriving activities required for construction of a cofferdam around the PG&E transmission tower foundations within Pond A2W is 6,900 feet. The nearest sensitive receptor to other construction equipment (e.g., bulldozers, compaction rollers, and excavators) generating vibration is 3,400 feet (Charleston Slough). Using FTA's recommended procedure, the predicted worst-case vibration levels at 6,900 feet would be approximately 0.0003 in/sec PPV and 39.0 VdB for operation of the piledriver. As the distance of construction activities increases, the vibration levels would decrease from those estimated above. From the calculated values, operation of Alternative Mountain View B would not exceed the Caltrans recommended standard of 0.2 in/sec PPV and would not exceed FTA's maximum-acceptable vibration standard of 80 VdB. As such, potential impacts would be less than significant.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1**,** which requires that construction activities be limited to the days and hours or vibration levels designated for the City of Mountain View, where the work activities would occur. Therefore, construction activities would not occur during vibration-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which requires trucks to avoid residential areas for haul routes. Therefore, vibration impacts from short-term construction activities would be less than significant.

O&M activities within Ponds A1 and A2W and Charleston Slough under Alternative Mountain View B would not require the use of piledrivers. Although heavy construction equipment may be needed to repair and maintain levees, SBSP Mitigation Measure 3.13-1 would be implemented. As such, vibration impacts resulting from O&M activities occurring under Alternative Mountain View B would not be significantly greater than those occurring under Alternative Mountain View A (No Action).

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Construction and operation of Alternative Mountain View C would be similar to that defined for Alternative Mountain View B, though the construction and operation would occur over a longer construction period and in somewhat more spatially distributed areas (to include Charleston Slough and the levees surrounding it). As such, no vibration resulting from construction or operation would occur.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative A8 A (No Action) activities would require limited O&M activities that would generate vibration. However, because O&M activities would occur during daytime, non-vibration-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, vibration effects during construction and/or operation would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Construction activities under this alternative have the potential to result in varying degrees of temporary groundborne vibration. Construction of Ponds A8 and A8S under Alternative A8 B would not require the use of piledriving. However, construction of Alternative A8 B would include use of a bulldozer, water trucks, compaction rollers, and other equipment. The nearest sensitive receptor to construction equipment (e.g., a bulldozer) generating vibration is 2,000 feet away. Using FTA's recommended procedure, the predicted worst-case vibration levels at approximately 2,000 feet would be approximately 0.0021 in/sec PPV and 29.9 VdB for operation of bulldozers, water trucks, and compaction rollers. As the distance of construction activities increases, the levels would decrease from those estimated above. From the calculated values, operation of Alternative A8 B would not exceed the Caltrans recommended standard of 0.2 in/sec PPV and would not exceed the FTA's maximum-acceptable vibration standard of 80 VdB.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1, which requires that construction activities be limited to the days and hours or vibration levels designated for the City of San Jose, where the work activities would occur. All construction equipment staging areas would be located at the furthest distance possible from nearby vibration-sensitive land uses, and construction equipment would be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications. Therefore, vibration impacts from short-term construction activities would be less than significant.

O&M activities within Ponds A8 and A8S under Alternative A8 B would not require the use of piledrivers or other heavy construction equipment that could potentially generate significant impacts from vibration. As such, no vibration resulting from operation would occur under Alternative A8 B.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, limited O&M activities would occur. Small crews of workers may be on-site during O&M activities; fewer workers would likely be on-site for O&M activities than for a typical construction worker crew, which would likely be five to 10 people. Alternative Ravenswood A (No Action) would require limited O&M activities that would generate vibration. However, because O&M activities would occur during daytime, non-vibration-sensitive hours only, and because such activities would occur intermittently within the 50-year planning period, vibration effects during construction and/or operation would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Construction activities under this alternative would have the potential to result in varying degrees of temporary groundborne vibration. Construction of Alternative Ravenswood B would require the use of piledrivers within Ponds R3, R4, R5, and S5 for the construction of water control structures. The nearest sensitive receptor to the piledriving activities would be 1,900 feet at Pond S5. The nearest sensitive receptor to other construction equipment (e.g., piledriver) generating vibration is 1,000 feet (Pond R3). Using FTA's recommended procedure, the predicted worst-case vibration levels at approximately 1,900 feet would be approximately 0.0021 in/sec PPV and 55.6 VdB for operation of the piledriver. As the distance of construction activities increases, the levels would decrease from those estimated above. From the calculated values, operation of Alternative Ravenswood B would not exceed the Caltrans recommended standard of 0.2 in/sec PPV and would not exceed FTA's maximum-acceptable vibration standard of 80 VdB.

As adopted in the 2007 EIS/R, the project is committed to implementing SBSP Mitigation Measure 3.13-1, which requires that construction activities be limited to the days and hours or vibration levels designated for the City of Menlo Park, where the work activities would occur. Therefore, construction activities would not occur during vibration-sensitive hours. The project is also committed to implementation of SBSP Mitigation Measure 3.13-2, which limits the hours that trucks may deliver fill and requires trucks to avoid residential areas for haul routes. Therefore, vibration impacts from short-term construction activities would be less than significant.

O&M activities with Ponds R3, R4, R5, and S5 under Alternative Ravenswood B would not require the use of piledrivers. Although heavy construction equipment may be needed to repair and maintain levees, SBSP Mitigation Measure 3.13-1 would be implemented. As such, vibration impacts resulting from O&M activities occurring under Alternative Ravenswood B would not be significantly greater than those occurring Alternative Ravenswood A (No Action).

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Operation and construction of Alternative Ravenswood C would be similar to that defined for Alternative Ravenswood B above. As such, potential impacts from construction would be less than significant and no vibration impacts would occur from operation.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Operation and construction of Alternative Ravenswood D would be similar to that defined for Alternative Ravenswood B above. As such, potential impacts from construction would be less than significant and no vibration impacts would occur from operation.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 noise impacts and levels of significance are summarized in Table 3.12-7. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features and the AMP and other Refuge management practices and documents. The noise analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.12-7 Phase 2 Summary of Impacts – Noise

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.12-1: Short-term construction noise effects.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.12-2: Traffic-related noise impacts during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.12-3: Traffic-related noise effects during operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-4: Potential operational noise effects from O&M activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-5: Potential vibration effects during construction and/or operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Note: Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.13 Air Quality

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing air quality within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on air. The information presented in this section is based on a review of the existing air quality conditions and other pertinent federal, state and local regulations, as presented in Section 3.13.2, Regulatory Setting. Using this information as context, an analysis of the air-quality-related environmental impacts of the project is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only includes additional, project-level mitigation measures as needed.

3.13.1 Physical Setting

Methodology

The methods of analysis and thresholds of significance are based on the Bay Area Air Quality Management District (BAAQMD) 2011 Air Quality Guidelines (BAAQMD 2010a, 2011).

Regional Setting

The proposed project is in the South Bay (i.e., portions of Alameda, San Mateo, and Santa Clara Counties) within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB also comprises all of Contra Costa, Marin, Napa, and San Francisco Counties, the southeast portion of Sonoma County, and the southwest portion of Solano County. The SFBAAB is generally bounded on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range.

The ambient concentrations of air pollutants in the SFBAAB are determined by the amount of emissions released by pollutant sources and the atmosphere’s ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources.

Topography, Meteorology, and Climate

The climate of the SFBAAB is characterized by mild summers and winters, moderate rainfall, daytime onshore breezes, and moderate humidity. Regional flow patterns affect air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions such as moderate winds disperse pollutants and reduce pollutant concentrations. When a warm layer of air traps cooler air close to the ground, an inversion layer is produced, hampering dispersion and trapping air pollutants near the ground. During summer mornings and afternoons, these inversions are present in the South Bay. The extended daylight hours during the summer also provide plentiful sunshine, which provides the energy needed to fuel photochemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROGs), which result in ozone formation.

Criteria Air Pollutants

Concentrations of ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$, which are particulate matter with diameters of 10 micrometers and 2.5 micrometers, respectively), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health, they are commonly referred to as "criteria air pollutants."

O_3 is formed from the interaction of ROGs, NO_x, and sunlight. Ground-level O_3 is the primary component of smog. Motor vehicles, industrial activities, and such consumer products as paints, inks, and adhesives emit ROGs. The combustion of gasoline, coal, and oil emits NO_x. O_3 exposure causes eye irritation and damage to lung tissue in humans. O_3 also harms vegetation, reduces crop yields, and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics.

CO is an odorless, colorless gas formed by the incomplete combustion of fuels. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. Exposure to high CO concentrations may result in headaches, dizziness, fatigue, unconsciousness, and even death.

NO_2 is a reddish-brown gas formed during combustion of fuels. Exposure to high concentrations may increase the risk of acute and chronic respiratory disease. NO_2 can also contribute to the formation of ground-level O_3.

SO_2 is a colorless gas emitted from fossil-fuel combustion sources and other industrial processes. SO_2 is linked to a number of adverse respiratory effects.

PM_{10} is particulate matter that is 10 micrometers or less in diameter. PM_{10} may come from a variety of sources and consists of a wide range of solid and liquid particles, including smoke, dust, aerosols, and metallic oxides. It evades the respiratory system's natural defenses and can lodge deep in the lungs when inhaled, aggravating chronic respiratory diseases. Long-term exposure to PM_{10} at levels exceeding State of California standards can lead to an increase in respiratory and cardiac illness, exacerbation of asthma, and increased death rates.

$PM_{2.5}$, also known as fine particulate matter, is particulate matter that is 2.5 micrometers or less in diameter. $PM_{2.5}$ exposure has been linked to health problems, including asthma, bronchitis, acute and chronic respiratory symptoms (e.g., shortness of breath and painful breathing), and premature death. People with existing heart or lung disease (e.g., asthma, chronic obstructive pulmonary disease, congestive heart disease), children, and the elderly appear to be at greatest risk for these severe health effects. In addition, $PM_{2.5}$ particles are a major source of visibility impairment.

Lead is a toxic metal that can adversely affect the nervous system, immune system, and reproductive and developmental systems. The major sources of lead emissions have historically been from fuels in motor vehicles and industrial sources.

In addition to the criteria pollutants described above, vinyl chloride, hydrogen sulfide (H_2S), sulfates, and visibility reducing particles are considered air pollutants that can adversely affect human health. Vinyl chloride is used to make vinyl products, and high exposure can lead to central nervous system effects and increased cancer risk. H_2S is formed during bacterial decomposition of sulfur-containing organic substances, has a very disagreeable odor, and is highly toxic. Sulfates are the fully oxidized ionic form of sulfur, and can cause adverse respiratory effects, degrade visibility, and harm or damage ecosystems and property. Visibility reducing particles consist of suspended particulate matter (PM), which is a complex mixture of dry, solid fragments; solid cores with liquid coatings; and small droplets of liquid. These particles can severely impair visibility and contribute to regional haze.

Further information about criteria pollutants and the common sources and health effects of criteria pollutants can be found in the BAAQMD 2012 CEQA Air Quality Guidelines (BAAQMD 2012a). Both the federal government and the state government have established air quality standards and goals to protect human health. Areas that meet these standards are designated as “attainment” areas, and areas that do not meet these standards are designated as “nonattainment” areas. Goals are established to improve air quality in nonattainment-designated areas. Additional information regarding attainment and the regulatory environment is provided in Section 3.13.2, Regulatory Setting.

Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs) are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health impact may pose a threat to public health even at low concentrations. TACs can cause long-term health effects (such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage) or short-term acute affects (such as eye watering, respiratory irritation, runny nose, throat pain, or headaches). The following 10 compounds pose the greatest known ambient risk based on air quality data or, in the case of diesel exhaust, concentration estimates: acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel PM. Naturally occurring asbestos (NOA) in rock and soil may also be of concern during earthmoving activities, as these activities can break NOA down to microscopic fibers that are easily suspended in air. When inhaled, these thin fibers irritate tissues and resist the body's natural defenses.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to a particular TAC. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Cancer risk is typically expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime exposure or other prolonged duration. For non-carcinogenic substances, there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels may vary depending on the specific pollutant. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels.

Odors

Typically, odors are regarded as a nuisance rather than a health hazard. However, manifestations of a person’s reaction to foul odors can range from psychological (e.g., irritation, anger, anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, headache). Sources of existing odor in the South Bay include the salt ponds. When algae and other biomass (which grow in the ponds) naturally decompose, H_2S gas can be produced, which generates odors. Also, odors are generated when the ponds dry and the mud bottoms are exposed to air (exposure of algae or brine shrimp). No odor complaints have been received in the Alviso and Ravenswood pond complexes since the United States Fish and Wildlife Service (USFWS) took over management of the ponds (Mruz, pers. comm., 2014).

Project Setting

This section focuses on the air quality conditions in the Phase 2 project area.

Alviso Pond Complex

Three of the Phase 2 pond clusters are in the Alviso pond complex, which is in the Santa Clara Valley subregion of the SFBAAB. The pollution potential is considered high in this subregion (BAAQMD 2012a). In this subregion, temperatures are warm on summer days and cool on summer nights, and winter temperatures are fairly mild; mean maximum temperatures within the pond complex are in the low-80s (degrees Fahrenheit) during the summer and the high-50s (degrees Fahrenheit) during the winter.

BAAQMD operates a regional air quality monitoring network that regularly measures the concentrations of the major criteria air pollutants. The nearest air quality monitoring station that provides the most representative ambient air quality at the pond complex is the San Jose–Jackson Street Station. Based on the monitoring data shown in Table 3.13-1, the $PM_{2.5}$, PM_{10}, and O_3 levels at this station have exceeded the ambient air quality standards consistently from 2011 through 2013. The NO_2 and CO emissions have consistently been below the ambient air quality standards in these years.

According to the California Geological Survey's map of *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California*, there are no NOA occurrences within the Alviso Pond Complex project area (USGS 2011).

Table 3.13-1 Summary of Ambient Air Quality in the Vicinity of the Alviso Pond Complex

POLLUTANT	STANDARD/EXCEEDANCE	SAN JOSE–JACKSON STREET STATION		
		2011	2012	2013
Ozone (O_3)	Max. 1-hour concentration (parts per million [ppm])	**0.098**	**0.101**	0.093
	Max. 8-hour concentration (ppm)	0.067	0.063	**0.080**
	# Days > federal 8-hour standard (std.) of > 0.075 ppm	0	0	1
	# Days > California 1-hour std. of > 0.09 ppm	1	1	0
	# Days > California 8-hour std. of > 0.07 ppm	0	0	1
Fine particulate matter ($PM_{2.5}$)	Max. 24-hour concentration (micrograms per cubic meter [$\mu g/m^3$])	**50.5**	**38.4**	**57.7**
	#Days > fed. 24-hour std. of > 35 $\mu g/m^3$	3	2	4
	Annual average ($\mu g/m^3$)	9.9	*	**12.4**
Respirable particulate matter (PM_{10})	Max. 24-hour concentration ($\mu g/m^3$)	44.3	**59.6**	**58.1**
	#Days > fed. 24-hour std. of > 150 $\mu g/m^3$	0	0	0
	#Days > California 24-hour std. of > 50 $\mu g/m^3$	0	1	5
	Annual average (µg/m3)	19.2	18.8	**22.2**
Carbon monoxide (CO)	Max. 8-hour concentration (ppm)	2.18	1.86	*
	# Days > federal 8-hour std. of > 9 ppm	0	0	*
	# Days > California 8-hour std. of > 9 ppm	0	0	*

Table 3.13-1 Summary of Ambient Air Quality in the Vicinity of the Alviso Pond Complex

POLLUTANT	STANDARD/EXCEEDANCE	SAN JOSE–JACKSON STREET STATION		
		2011	2012	2013
Nitrogen dioxide (NO_2)	Max. 1-hour concentration (ppm)	0.061	0.067	0.059
	# Days > California 1-hour std. of > 0.18 ppm	0	0	0
	Annual average (ppm)	0.014	0.013	0.015
Sulfur dioxide (SO_2)	Max. 24-hour concentration (ppm)	0.003	0.003	0.001
	Annual average (ppm)	0.000	*	*

Notes:
Data from San Jose–Jackson Street Monitoring Station.
* Indicates there was insufficient data to determine the value.
Exceedances of federal or state standards are shown in **bold** text.
Source of air quality monitoring data: CARB 2014.

Alviso-Island Ponds

The Alviso-Island pond cluster is in the eastern portion of the Alviso pond complex. The ponds in this cluster are oriented east to west between Mud Slough to the north and west and Coyote Creek to the south. The community of Alviso and the cities of Milpitas and Fremont are to the south and to the north and east, respectively, but the ponds are geographically isolated from any urbanized and built-out areas by waterbodies, other salt ponds, and a landfill. The former community of Drawbridge is on a strip of land between Pond A20 and Pond A21. That strip of land also holds an active Union Pacific Railroad track.

The air quality characteristics of these ponds are similar to those described for the entire pond complex, due to the regional nature of air quality effects. There are no sensitive receptors within the pond cluster and limited sensitive receptors adjacent to the pond cluster. The closest sensitive land uses are in the city of Fremont (residences); they are approximately 8,000 feet east of the eastern boundary of the pond cluster (City of Fremont 2011).

Alviso-Mountain View Ponds

The Alviso-Mountain View pond cluster is in the western portion of the Alviso pond complex. The ponds, creek, and sloughs of the pond cluster are adjacent to each other in an east-to-west orientation between the Palo Alto Flood Basin to the west, Mountain View Shoreline Park and Stevens Creek Marsh to the south, Stevens Creek to the east, and open bay water to the north. The cities of Mountain View and Palo Alto are immediately inland of the pond cluster to the south and west, respectively.

The air quality characteristics of these ponds are similar to those described for the entire pond complex, due to the regional nature of air quality effects. There are no sensitive receptors within the pond cluster and limited sensitive receptors adjacent to the pond cluster. The closest sensitive land uses are in the city of Palo Alto (residences); they are approximately 3,400 feet southwest of the western boundary of the pond cluster (City of Mountain View 2012; City of Palo Alto 2011).

Alviso-A8 Ponds

The Alviso-A8 Pond cluster is on the southern portion of the Alviso pond complex. It is bounded to the north and west by other ponds, to the south by open space, and to the east by the community of Alviso. The Guadalupe River separates the pond from the community.

The air quality characteristics of these ponds are similar to those described for the entire pond complex, due to the regional nature of air quality effects. There are no sensitive receptors within the pond cluster and limited sensitive receptors adjacent to the pond cluster. The closest sensitive land uses are in the community of Alviso (residences); they are approximately 600 feet to the east of the pond cluster eastern boundary (City of San Jose 2011). George Mayne Elementary School in the community of Alviso is approximately 3,600 feet to the east of the eastern boundary.

Ravenswood Ponds

The Ravenswood pond complex is in the peninsula subregion of the SFBAAB. In the peninsula subregion, air pollution potential is highest in the southeastern portion due to the topography, meteorology, and emission sources of the area (BAAQMD 2012a).

The nearest monitoring station that provides the most representative ambient air quality for the Ravenswood pond complex is the Redwood City Station. Based on the monitoring data shown in Table 3.13-2, $PM_{2.5}$ concentrations exceeded the ambient air quality standards in 2011 and 2013, and O_3 concentrations exceeded the standards in 2013. NO_2 and CO concentrations have consistently been below the ambient air quality standards since 2011. According to the California Geological Survey's map of *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California*, there are no NOA occurrences within the Ravenswood pond complex project area (USGS 2011).

Table 3.13-2 Summary of Ambient Air Quality in the Vicinity of the Ravenswood Pond Complex

POLLUTANT	STANDARD/EXCEEDANCES	REDWOOD CITY STATION		
		2011	2012	2013
Ozone (O_3)	Max. 1-hour concentration (ppm)	0.076	0.063	0.083
	Max. 8-hour concentration (ppm)	0.062	0.055	**0.076**
	# Days > federal 8-hour std. of > 0.075 ppm	0	0	0
	# Days > California 1-hour std. of > 0.09 ppm	0	0	0
	# Days > California 8-hour std. of > 0.07 ppm	0	0	1
Fine particulate matter ($PM_{2.5}$)	Max. 24-hour concentration (µg/m^3)	**39.7**	34.3	**39.0**
	#Days > federal 24-hour std. of > 35 µg/m^3	1	0	3
	Annual average (µg/m^3)	8.7	8.5	10.7
Carbon monoxide (CO)	Max. 8-hour concentration (ppm)	1.67	1.81	*
	# Days > federal 8-hour std. of > 9 ppm	0	0	*
	# Days > California 8-hour std. of > 9 ppm	0	0	*

Table 3.13-2 Summary of Ambient Air Quality in the Vicinity of the Ravenswood Pond Complex

POLLUTANT	STANDARD/EXCEEDANCES	REDWOOD CITY STATION		
		2011	2012	2013
Nitrogen dioxide (NO_2)	Max. 1-hour concentration (ppm)	0.056	0.060	0.054
	# Days > California 1-hour std. of > 0.18 ppm	0	0	0
	Annual average (ppm)	0.012	0.011	0.012

Notes:
Data from Redwood City Monitoring Station.
* Indicates there was insufficient data to determine the value.
Exceedances of federal or state standards are shown in **bold** text.
Source of air quality monitoring data: CARB 2014.

The Phase 2 Ravenswood pond cluster is the western half of the Ravenswood pond complex as a whole. The Phase 2 Ravenswood ponds are bordered by the Bedwell Bayfront Park to the west, State Route 84 and the City of Menlo Park to the south, Ravenswood Slough to the east, and Greco Island and open bay water to the north. The City of Menlo Park is immediately inland of the pond cluster to the south and west.

The air quality characteristics of these ponds are similar to those described for the entire pond complex, due to the regional nature of air quality effects. There are no sensitive receptors within the pond cluster and limited sensitive receptors adjacent to the pond cluster. The closest sensitive uses are in the city of Menlo Park (residences); they are approximately 1,000 feet south of the southern boundary of the pond cluster (City of Menlo Park 2013). Beechwood School and Belle Haven Elementary School are both approximately 1,600 feet south of the pond cluster.

Existing Conditions

Currently, the Alviso-Mountain View pond cluster contains recreational uses along the western levee of Charleston Slough and the southern borders of Ponds A1 and A2W, the latter of which are in the City of Mountain View's Shoreline Park. Recreational uses are also adjacent to the Ravenswood pond cluster in the City of Menlo Park's Bedwell Bayfront Park. Access to these areas for recreational uses results in indirect sources of mobile emissions. Mobile emissions may also be generated by USFWS staff and others (e.g., Pacific Gas and Electric Company [PG&E] staff) accessing the project areas to perform Adaptive Management Plan (AMP) monitoring, research, and operation and maintenance (O&M) activities for facilities within and near the pond clusters. Activities can include replacement and/or repairs of water control structures, limited levee maintenance and inspection, and trail maintenance. A pump is currently used to draw 8 to 10 million gallons of water per day from Charleston Slough and deliver it to Shoreline Park's sailing lake. The intake is as the foot of Charleston Slough on the southwestern edge of the Alviso-Mountain View pond cluster.

3.13.2 Regulatory Setting

Air quality in the South Bay is regulated by the United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the BAAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to attain the directives imposed through legislation. Although USEPA regulations may not be superseded, both state and local regulations may be more stringent.

Federal Laws and Regulations

USEPA has been charged with implementing national air quality programs. USEPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major CAA amendments were made by Congress in 1990.

Federal Clean Air Act

The CAA required USEPA to establish national ambient air quality standards (NAAQS). USEPA has established primary and secondary NAAQS for the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect public health and the secondary standards protect public welfare. The primary standards are shown in Table 3.13-3, along with current attainment designations for the SFBAAB. The CAA also requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. USEPA has responsibility to review all state SIPs to determine conformity to the mandates of the CAA and the amendments thereof and determine if implementation will achieve air quality goals. If USEPA determines an SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Table 3.13-3 Ambient Air Quality Standards and Designations

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS		FEDERAL STANDARDS	
		CONCENTRATION	ATTAINMENT STATUS	CONCENTRATION	ATTAINMENT STATUS
Ozone (O_3)	8 Hours	0.070 ppm ($137\ \mu g/m^3$)	N	0.075 ppm	N
	1 Hour	0.09 ppm ($180\ \mu g/m^3$)	N	—	—
Carbon monoxide (CO)	8 Hours	9.0 ppm (10 milligrams per cubic meter [mg/m^3])	A	9 ppm ($10\ mg/m^3$)	A
	1 Hour	20 ppm ($23\ mg/m^3$)	A	35 ppm ($40\ mg/m^3$)	A
Nitrogen dioxide (NO_2)	1 Hour	0.18 ppm ($339\ \mu g/m^3$)	A	0.100 ppm ($188\ \mu g/m^3$)	U
	Annual arithmetic mean	0.030 ppm ($57\ \mu g/m^3$)	—	0.053 ppm ($100\ \mu g/m^3$)	A

Table 3.13-3 Ambient Air Quality Standards and Designations

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS		FEDERAL STANDARDS	
		CONCENTRATION	ATTAINMENT STATUS	CONCENTRATION	ATTAINMENT STATUS
Sulfur dioxide (SO_2)	24 Hours	0.04 ppm (105 μg/m^3)	A	0.14 ppm (365 μg/m^3)	A
	1 Hour	0.25 ppm (655 μg/m^3)	A	0.075 ppm (196 μg/m^3)	A
	Annual arithmetic mean	—	—	0.030 ppm (80 μg/m^3)	A
Particulate matter (PM_{10})	Annual arithmetic mean	20 μg/m^3	N	—	—
	24 Hours	50 μg/m^3	N	150 μg/m^3	U
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	12 μg/m^3	N	12.0 μg/m^3	A
	24 Hours	—	—	35 μg/m^3	N
Sulfates	24 Hours	25 μg/m^3	A	—	—
Lead	30-Day average	1.5 μg/m^3	A	—	A
	Calendar quarter	—	—	1.5 μg/m^3	A
	Rolling 3-month average	—	—	0.15 μg/m^3	U
Hydrogen sulfide	1 Hour	0.03 ppm (42 μg/m^3)	U	—	—
Vinyl chloride	24 Hours	0.010 ppm (26 μg/m^3)	U	—	—
Visibility reducing particles	8 Hours	Extinction of 0.23 per kilometer	U	—	—

Notes:
A = Attainment
N = Nonattainment
U = Unclassified
Source of attainment status: BAAQMD 2013a.
Source of federal and state standards: CARB 2013.

General Conformity

General conformity analysis is performed to determine if federal actions conform to the current SIP. If an area is designated as a federal nonattainment or maintenance area, general conformity applies for the criteria pollutants that are in nonattainment or maintenance. Within these areas, general conformity applies to any federal action not specifically exempted by the CAA or USEPA regulations. Emissions from construction activities are also included. General conformity does not apply to projects or actions that are covered by the transportation conformity rule. If a federal action falls under the general conformity rule, the federal agency responsible for the action is responsible for making the conformity determination. Applicability analyses to determine conformity are required to quantify short- and long-term emissions of air pollutants from implementation of a proposed project and to determine whether the project would cause or contribute to any new violation of any standard, interfere with maintenance of any standard, increase the frequency or severity of any existing violation of any standard, or delay timely attainment of any standard. The applicability of Phase 2 actions to conformity is addressed in Section 3.13.3, Environmental Impacts and Mitigation Measures.

Federal Hazardous Air Pollutant Programs

USEPA has programs for identifying and regulating Hazardous Air Pollutants (HAPs). Title III of the CAAA directs USEPA to promulgate National Emissions Standards for HAPs (NESHAP). The NESHAP may have different standards for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any HAP or more than 25 tpy of any combination of HAPs; all other sources are considered area sources. The standards require the application of technology-based emissions standards referred to as Maximum Achievable Control Technology (MACT). USEPA completed the emission standards required by Section 112 of the CAA in 2011 (USEPA 2011). The enforcement of these standards is currently supported by USEPA's Air Toxics National Enforcement Initiative.

The CAAA also required USEPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. Also, Section 219 of the CAAA required the use of reformulated gasoline in selected areas with the most severe O_3 nonattainment conditions to further reduce mobile-source emissions.

State Laws and Regulations

California Clean Air Act

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA was adopted in 1988; it requires CARB to establish California Ambient Air Quality Standards (CAAQS) (Table 3.13-1). CARB has established CAAQS for sulfates, H_2S, vinyl chloride, visibility reducing particulate matter, and the above-mentioned federal criteria air pollutants. In most cases, the CAAQS are more stringent than the NAAQS.

Other CARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws; approving local air quality plans; submitting SIPs to USEPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

In-Use Off-Road Diesel Vehicle Regulation

In 2007, CARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use off-road heavy-duty diesel vehicles in California. The regulation imposes limits on vehicle idling and requires fleets to reduce emissions by retiring, replacing, repowering, or installing exhaust retrofits to older engines. In December 2010, major amendments were made to the regulation, including a delay of the first performance standards compliance date to no earlier than January 1, 2014 (CARB 2010).

State Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (California Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) (Hot Spots Act). To date, CARB has identified over 21 TACs, and adopted USEPA's list of HAPs as TACs.

CARB has adopted Airborne Toxics Control Measures for sources that emit a particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

CARB adopted a Diesel Risk Reduction Plan, which recommends control measures to achieve a diesel PM reduction of 85 percent by 2020 from year 2000 levels. Recent regulations and programs include the low-sulfur diesel fuel requirement and more stringent emission standards for heavy-duty diesel trucks and off-road in-use diesel equipment. As emissions are reduced, it is expected that the risks associated with exposure to the emissions will also be reduced.

Local Laws and Regulations

Bay Area Air Quality Management District

BAAQMD is the primary agency responsible for ensuring that air quality standards (NAAQS and CAAQS) are attained and maintained in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. BAAQMD prepares ozone attainment plans (OAPs) for the national ozone standard, clean air plans (CAPs) for the California standard, and particulate matter plans to fulfill federal air quality planning requirements. BAAQMD also inspects stationary sources of air pollution, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and the CCAA.

California Environmental Quality Act Guidelines

BAAQMD developed quantitative thresholds of significance for its California Environmental Quality Act (CEQA) guidelines in 2010, which were also included in its updated 2011 guidelines (BAAQMD 2010a, 2011). BAAQMD's adoption of the 2010 thresholds of significance (2010 Thresholds) was later challenged, resulting in a court-ordered ruling issued March 5, 2012, in *California Building Industry Association v. BAAQMD* (Alameda County Superior Court Case No. RGI0548693). The order requires the BAAQMD thresholds to be subject to further environmental review under CEQA. As a result, BAAQMD released updated guidelines in 2012 with references to the CEQA thresholds removed (BAAQMD 2012a). BAAQMD later appealed the ruling, and the judgment was reversed on August 13, 2013, by the Court of Appeal of the State of California, First Appellate District. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending there.

The claims made in the case concerned the CEQA impacts of adopting the thresholds, and petitioners argued that the thresholds for Health Risk Assessments encompassed issues not addressed by CEQA. The court did not specifically address whether the thresholds were supported by "substantial evidence." At this time, BAAQMD is no longer recommending use of the 2010 Thresholds, and instead recommends that lead agencies determine appropriate air quality thresholds of significance based on substantial evidence in the record.

For this air quality analysis, the 2010 Thresholds were used because they were established based on substantial evidence. The BAAQMD released the "Proposed Thresholds of Significance" in 2009, which listed the proposed thresholds for criteria pollutants, greenhouse gases (GHGs), community risk and hazards, and odors. BAAQMD researched existing and projected sources of air quality contaminants and designed the 2010 Thresholds to comply with state and federal standards. The report "provides the *substantial evidence* in support of the thresholds of significance…" (emphasis added) (BAAQMD 2009). The thresholds for criteria pollutants were developed through a quantitative examination of the efficacy of fugitive dust mitigation measures and a quantitative examination of statewide non-attainment emissions.

The issues identified in the BAAQMD CEQA Air Quality Guidelines' court case are not considered relevant to the scientific soundness of the BAAQMD's analysis of the level at which a pollutant would potentially significantly affect air quality. Therefore, the usage of these 2010 Thresholds is consistent with the BAAQMD's direction that thresholds should be based on substantial evidence.

BAAQMD 2010 Clean Air Plan

BAAQMD adopted the Bay Area Clean Air Plan (Bay Area CAP) in 2010 to provide a plan to improve Bay Area air quality and meet public health goals. More specifically, the control strategy described in the Bay Area CAP is designed to reduce emissions and decrease ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce GHG emissions to protect the climate.

The Bay Area CAP addresses four categories of pollutants: (1) ground-level O_3 and its key precursors, ROG and NO_x; (2) PM, primarily $PM_{2.5}$, and precursors to secondary $PM_{2.5}$; (3) air toxics; and (4) GHGs. The control strategy in the Bay Area CAP describes stationary source measures, transportation control measures, mobile source measures, land use and local impact measures, energy and climate measures, and further study measures to reduce air pollutants (BAAQMD 2010b).

Particulate Matter Plan

To fulfill federal air quality planning requirements, the BAAQMD adopted a $PM_{2.5}$ emissions inventory for year 2010 at a public hearing on November 7, 2012. The Bay Area 2010 CAP also included several measures for reducing PM emissions. On January 9, 2013, USEPA issued a final rule determining that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS, suspending federal SIP planning requirements for the Bay Area (BAAQMD 2013b). The San Francisco Bay Area is currently designated as an attainment maintenance area.

BAAQMD 2001 Ozone Attainment Plan

BAAQMD adopted the Bay Area Ozone Attainment Plan in 2001 in response to USEPA's finding of failure of the Bay Area to attain the national ambient air quality standard for O_3. The plan includes a control strategy for O_3 and its precursors to ensure reduction in emissions from stationary sources, mobile sources, and the transportation sector (BAAQMD 2001).

Plan Bay Area

On July 18, 2013, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) approved the Plan Bay Area. The plan includes the San Francisco Bay Area Sustainable Communities Strategy (SCS), in accordance with California Senate Bill (SB) 375, and the 2040 Regional Transportation Plan. The Bay Area Plan includes integrated land use and transportation strategies for the region and was developed through OneBayArea, a joint initiative between ABAG, BAAQMD, MTC, and the Bay Conservation and Development Commission (BCDC). The plan's transportation policies focus on maintaining the extensive existing transportation network and utilizing these systems more efficiently to handle density in Bay Area transportation cores (ABAG and MTC 2013).

Local Toxic Air Contaminant Programs

Under BAAQMD regulations, all stationary sources that possess the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. BAAQMD limits emissions and public exposure to TACs through a number of programs. BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Odors

Because offensive odors rarely cause any physical harm, neither the state nor the federal government has adopted any rules or regulations regarding odors. However, BAAQMD has adopted Regulation 7 (Odorous Substances), which specifically addresses citizen complaints. If 10 or more complaints are received within a 90-day period alleging that a person has caused odors perceived at or beyond the property line of such person and that these odors are deemed to be objectionable by the complainants in the normal course of their work, travel or residence, this regulation becomes applicable. When 10 or more citizen complaints are received, the limits of this regulation become effective and shall remain effective until such time as no citizen complaints have been received by the Air Pollution Control Officer for 1 year. The limits of this regulation shall become applicable again when the Air Pollution Control Officer receives odor complaints from five or more complainants within a 90-day period.

General Plans

Many of the cities and counties near the project area have adopted general plans containing strategies and policies regarding air quality and emissions. Applicable items from these plans include the following:

- City of Fremont General Plan – **Implementation 7-7.1.G: Air Emission Standards.** Promote enforcement of air emission standards by BAAQMD.
- City of Fremont General Plan – **Implementation 7-7.2.A: Construction Practices.** Require construction practices that reduce dust and other particulate emissions and require watering of exposed areas at construction sites.
- City of Fremont General Plan – **Implementation 7-7.4.A: Alternative-Fuel Vehicles.** Encourage other agencies and private industry to use alternative-fuel vehicles.

- City of Menlo Park General Plan – **Policy OSC5.1 Air and Water Quality Standards.** Continue to apply standards and policies established by the BAAQMD, San Mateo Countywide Water Pollution Prevention Program …, and City of Menlo Park Climate Action Plan through the California Environmental Quality Act … process and other means as applicable.
- City of Mountain View General Plan – **Policy INC 20.1: Pollution prevention.** Discourage mobile and stationary sources of air pollution.
- City of Mountain View General Plan – **Policy INC 20.6: Air quality standards.** Protect the public and construction workers from construction exhaust and particulate emissions.
- City of Mountain View General Plan – **Policy INC 20.7: Protect sensitive receptors.** Protect the public from substantial pollutant concentrations.
- City of Mountain View General Plan – **Policy INC 20.8: Offensive odors.** Protect residents from offensive odors.
- City of Palo Alto General Plan – **Policy N-27.** Reduce emission of particulates from wood burning stoves, construction activity, automobiles, and other sources.
- City of San Jose – **Policy MS-11.3.** Review projects generating significant heavy duty truck traffic to designate truck routes that minimize exposure of sensitive receptors to TACs and particulate matter.
- City of San Jose – **Action MS-11.8.** For new projects that generate truck traffic, require signage which reminds drivers that the State truck idling law limits truck idling to five minutes.
- City of San Jose – **Policy MS-12.1.** For new, expanded, or modified facilities that are potential sources of objectionable odors (such as landfills, green waste and resource recovery facilities, wastewater treatment facilities, asphalt batch plants, and food processors), the City requires an analysis of possible odor impacts and the provision of odor minimization and control measures as mitigation.
- City of San Jose – **Policy MS-13.1.** Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type.
- City of San Jose – **Policy MS-13.2.** Construction and/or demolition projects that have the potential to disturb asbestos (from soil or building material) shall comply with all the requirements of the California Air Resources Board's air toxics control measures for Construction, Grading, Quarrying, and Surface Mining Operations.
- City of San Jose – **Action MS-13.4.** Adopt and periodically update dust, particulate, and exhaust control standard measures for demolition and grading activities to include on project plans as conditions of approval based upon construction mitigation measures in the BAAQMD CEQA Guidelines.

- City of San Jose – **Action MS-13.5.** Prevent silt loading on roadways that generates particulate matter air pollution by prohibiting unpaved or unprotected access to public roadways from construction sites.
- City of San Jose – **Action MS-13.6.** Revise the grading ordinance and condition grading permits to require that graded areas be stabilized from the completion of grading to commencement of construction.

3.13.3 Environmental Impacts and Mitigation Measures

Overview

The proposed Phase 2 activities were evaluated to determine whether each alternative conforms to the SIP (as described in Section 3.13.2, Regulatory Setting) and whether each alternative would exceed the thresholds contained in the BAAQMD 2011 Guidelines, as described above (BAAQMD 2012a). The SFBAAB is currently designated as a marginal nonattainment area with respect to the national 8-hour ozone standard and as a nonattainment area for the 24-hour $PM_{2.5}$ standard. Also, portions of the SFBAAB are designated as maintenance areas for the national CO standard. General conformity requirements would not apply to actions where the total project-generated direct or indirect emissions would not be equal to or exceed the applicable emissions levels, known as the de minimis thresholds, and would be less than 10 percent of the area’s annual emissions budget, known as regionally significant thresholds. The de minimis thresholds applicable to the SFBAAB are 50 tons per year for ROGs and 100 tons per year for $PM_{2.5}$, NO_x, and CO.

Significance Criteria

For the purpose of this analysis, the project would result in a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the CEQA Guidelines (AEP 2014), the significance standards established by the applicable air quality management or air pollution control district may be used to evaluate impacts. Impacts related to the first two significance criteria are discussed in the short term under Phase 2 Impact 3.13-1 and in the long term under Phase 2 Impact 3.13-2. Impacts to sensitive receptors from exposure to substantial pollutant concentrations, including TACs, are discussed in Phase 2 Impact 3.13-3. Impacts from objectionable odors are discussed in Phase 2 Impact 3.13-4.

As discussed in the Section 3.13.2, Regulatory Setting, this analysis follows the thresholds and methodology contained in the BAAQMD 2011 Guidelines. According to these Guidelines, if average daily emissions of construction-related criteria air pollutants or precursors would exceed any applicable threshold of significance listed in Table 3.13-4, the project would result in a significant impact.

Table 3.13-4 Thresholds of Significance for Construction-Related Activities

POLLUTANT	AVERAGE DAILY EMISSIONS (LB/DAY)
ROG	54
NO_x	54
PM_{10} (exhaust only)	82
$PM_{2.5}$ (exhaust only)	54
PM_{10}/$PM_{2.5}$ (fugitive dust)	Best Management Practices
Source: BAAQMD 2011.	

If average daily or maximum annual emissions of operational-related criteria air pollutants or precursors would exceed any applicable threshold of significance listed in Table 3.13-5, the project would result in a significant impact. According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan.

Table 3.13-5 Thresholds of Significance for Operations-Related Activities

POLLUTANT	MAXIMUM ANNUAL EMISSIONS (TONS/YEAR)	AVERAGE DAILY EMISSIONS (LB/DAY)
ROG	10	54
NO_x	10	54
PM_{10}	15	82
$PM_{2.5}$	10	54
Source: BAAQMD 2011.		

The BAAQMD defines sensitive receptors as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these types of land uses include schools, hospitals, and residential areas. The BAAQMD 2011 Guidelines recommend a phased approach to estimating community risks and hazards. A site screening should be conducted to determine if the project would result in receptors being within 1,000 feet of a PM or TAC source. A project would be considered to have a significant impact on sensitive receptors if it would result in release of toxic air contaminants (diesel particulate matter and volatile organic compounds) that would increase cancer risk by 10 in 1,000,000, non-cancer chronic risk by 1.0 Hazard Index, or increase $PM_{2.5}$ concentrations above 0.3 $\mu g/m^3$ on an annual average basis within a zone of influence that includes a 1,000-foot radius around the project property lines.

Odors would be considered significant if the project would result in a frequent exposure of members of the public to objectionable odors or five or more confirmed complaints per year averaged over 3 years. According to the BAAQMD, typical uses that may result in significant odor impacts include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing, fiberglass manufacturing, painting/coating operations, rendering plants, and coffee roasters.

As explained in Section 3.1.2, Environmental Setting and Impact Analysis, although both the CEQ Regulations for Implementing NEPA (CEQ 2015) and the CEQA Guidelines were considered during the impact analysis, the impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation Summary

On a programmatic level, the determination was made in the 2007 EIS/R that under the implementation of Programmatic Alternative C, the alternative selected for implementation, there would be less-than-significant impacts as a result of long-term emissions and odors. Short-term emissions and TAC impacts for this alternative were less than significant with mitigation. Program-level mitigation measures were developed to minimize construction-generated fugitive dust emissions and to minimize the potential effects of TAC emissions to sensitive receptors. These mitigation measures, updated to match BAAQMD’s 2012 CEQA Guidelines (BAAQMD 2012a), have been incorporated into the project design of all Action Alternatives. Because Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project is an early phase of the overall SBSP Restoration Project, its implemented actions meet the objectives of Programmatic Alternative B as well as Programmatic Alternative C. The impacts and mitigation measures for Programmatic Alternative B were the same as those for Alternative C, summarized above.

Project-Level Evaluation

The following paragraphs summarize common definitions and methodological approaches that were used in conducting all of the project-level impacts for the construction phase and the operations phase of the SBSP Restoration Project.

Construction

Construction activities associated with the Action Alternatives may generate direct emissions from off-road equipment usage and earthmoving activities (for fugitive dust). Project-specific equipment types, equipment activities, and construction phasing and durations were used in the analysis. Emissions from off-road construction equipment were calculated using emission factors from CARB’s OFFROAD2011 and OFFROAD2007, as compiled by the Sacramento Metropolitan Air Quality Management District (SMAQMD) Sacramento Metropolitan Air Quality Management District (SMAQMD 2013). RoadMod emission factors use OFFROAD2007 emissions data for select pollutants and equipment types that are not available in OFFROAD2011. Portable barges used to carry fuel and position equipment and fill material were assumed to be non-self-propelled and maneuvered using a gasoline-powered outboard motor boat. Fugitive dust emissions were estimated using methodologies from USEPA AP-42 (CAPCOA 2013). Further modeling input assumptions and output results are provided in Appendix H.

Construction may also generate on-road vehicle trips from workers, construction staff, and material hauling. Project-specific worker trip rates were used in the analysis. On-road vehicle emissions from worker and construction staff trips were calculated using emission factors from EMFAC2011, as compiled by RoadMod v7.1.4 (SMAQMD 2013). Fleet mix and trip length assumptions used in the analysis were consistent with methodologies from SMAQMD RoadMod v7.1.4. As discussed in Chapter

2, Alternatives, the fill material used for construction would be surplus fill material originating from local off-site resources. Emissions associated with the transport of this material from these off-site locations to landfills have already been evaluated as a component of prior projects. As described in Section 3.11, Traffic, the Phase 2 construction would result in these haul truck trips being diverted from their original landfill destinations to the applicable Phase 2 project areas. Portions of the truck trip lengths to the applicable Phase 2 project areas were considered to be generated by Phase 2 to provide a conservative estimate of construction emissions. The material-hauling truck trip lengths for each pond cluster were estimated using the distance from nearby U.S. Highway 101 (U.S. 101) freeway exits to the project sites; transport from the source project(s) onto U.S. 101 and to the relevant exit for the SBSP Restoration Project are assumed to be covered by the NEPA/CEQA document for those source project(s), as that material would need to be transported to a disposal site regardless of the SBSP Restoration Project. Detailed modeling input assumptions and output results are provided in Appendix H.

Construction emissions for the Phase 2 pond clusters and alternatives are presented in Phase 2 Impact 3.13-1.

Operations

Operations at the pond clusters under all No Action[1] and Action Alternatives may generate direct emissions from equipment usage and on-road vehicle trips during the O&M activities described in Chapter 2, Alternatives. These activities include levee inspections and maintenance, water control structure maintenance, railroad track maintenance, and biological surveys. Pumps are currently used at the Alviso-Mountain View pond cluster and would continue operating under the No Action and Action Alternatives for the Alviso-Mountain View pond cluster. Water control structures would be installed under certain alternatives. However, operation of these water control structures would involve adjustments of hand-operated gates and would not require the use of off-road equipment. The No Action and Action Alternatives are not expected to substantially increase the level of operational activities at any of the pond clusters. Therefore, operational activities and operational emissions at the pond clusters would be similar to existing conditions under the No Action and Action Alternatives. Operations emissions for the pond clusters and alternatives are presentation in Phase 2 Impact 3.13-2.

Phase 2 Impact 3.13-1: Short-term construction-generated air pollutant emissions.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no construction activities would occur within the Alviso-Island pond cluster. Although O&M activities would be ongoing, they are considered part of project operation, not project construction. As such, no construction-generated emissions would occur.

Long-term operational air pollutant emissions are evaluated in Phase 2 Impact 3.13-2.

Alternative Island A Level of Significance: No Impact

1 “No Action Alternative” is the NEPA term. It corresponds to the CEQA term “No Project Alternative.” This Final EIS/R uses No Action throughout.

Alternative Island B. Implementation of Alternative Island B would involve removal, breaching, and lowering of levees. Construction activities would last approximately 16 months. Earthmoving activity would occur under Alternative B, but materials would be used on-site and not require off-site hauling trips. Construction activities would result in the temporary generation of emissions from earthmoving activities, exhaust from off-road equipment and worker commute activity, and other miscellaneous activities.

As shown in Table 3.13-6, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Island B would conform to the SIP.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-related emissions would not exceed the thresholds of significance, Alternative Island B would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. The project design features include a number of fugitive dust control measures that would meet the BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines (BAAQMD 2011).

Table 3.13-6 Alternative Island B Construction Emissions Summary

EMISSIONS	ROG	CO	NO_X	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.11	0.64	1.03	0.05	0.05	0.05	0.05
Construction (tons/year)	0.08	0.48	0.77	0.04	0.04	0.04	0.04
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	0.64	3.61	5.84	0.30	0.27	0.30	0.27
BAAQMD thresholds (lb/day)	54	—	54	82	54	Best Manage-ment Practices (BMP)s	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:

Alternative Island B construction assumed to occur over 16 months, 22 days/month.

See Appendix H for modeling input assumptions and output results.

Because construction activities associated with Alternative Island B would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative B would be less than significant.

Alternative Island B would generate minimal short-term construction emissions and would therefore have a less-than-significant impact on air quality.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Implementation of Alternative Island C would involve excavation of pilot channels and the removal, breaching, and lowering of levees. Construction activities would last approximately 19 months. Earthmoving activity would occur under Alternative C, but materials would be used on-site and not require off-site hauling trips. Construction activities would result in the temporary generation of emissions from earthmoving activities, exhaust from off-road equipment and worker commute activity, and other miscellaneous activities.

As shown in Table 3.13-7, construction-generated daily emissions of ROGs, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds, and annual emissions of ROGs, CO, NO_x, and total $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Island C would conform to the SIP.

Table 3.13-7 Alternative Island C Construction Emissions Summary

EMISSIONS	ROG	CO	NO_X	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.31	1.28	1.71	0.11	0.10	0.11	0.10
Construction (tons/year)	0.20	0.81	1.08	0.07	0.06	0.07	0.06
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	1.50	6.13	8.17	0.53	0.48	0.53	0.48
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:

Alternative Island C construction assumed to occur over 19 months, 22 days/month.

See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-related emissions would not exceed the thresholds of significance, Alternative Island C would not conflict with the applicable air quality plan. Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. As discussed in Alternative Island B, project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Island C would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative C would be less than significant.

Alternative Island C would generate minimal short-term construction emissions and would therefore have a less-than-significant impact on air quality.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no construction activities would occur within the Alviso-Mountain View pond cluster. While O&M activities would be ongoing, they are considered part of project operation, not project construction. As such, no construction-generated emissions would occur.

Long-term operational air pollutant emissions are evaluated in Phase 2 Impact 3.13-2.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Implementation of Alternative Mountain View B would involve levee improvements, creation of islands, creation of tidal habitat, and construction of recreational facilities. Construction activities would last approximately 27 months. Approximately 296,400 cubic yards (cy) of material would be transported to the project area from off-site locations. Construction would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, and worker commute activity; and other miscellaneous activities.

As shown in Table 3.13-8, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Mountain View B would conform to the SIP.

Table 3.13-8 Alternative Mountain View B Construction Emissions Summary

EMISSIONS	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	4.98	10.32	8.20	1.07	0.97	1.16	0.98
Construction (tons/year)	2.21	4.59	3.64	0.47	0.43	0.52	0.44
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	16.76	34.75	27.60	3.59	3.27	3.92	3.30
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:

Alternative Mountain View B construction assumed to occur over 27 months, 22 days/month.

See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative Mountain View B would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Mountain View B would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative B would be less than significant.

Alternative Mountain View B would generate minimal short-term construction emissions and would therefore have a less-than-significant impact on air quality.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Implementation of Alternative Mountain View C would involve levee improvements, creation of islands, creation of tidal habitat, and construction of recreational facilities. Construction activities would last approximately 35 months. Approximately 369,600 cy of material would be transported to the project area from off-site locations. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, and worker commute activity; and other miscellaneous activities.

As shown in Table 3.13-9, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Mountain View C would conform to the SIP.

Table 3.13-9 Alternative Mountain View C Construction Emissions Summary

EMISSIONS	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	5.01	10.47	8.71	1.08	0.98	1.15	0.99
Construction (tons/year)	2.00	4.19	3.48	0.43	0.39	0.46	0.39
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	15.18	31.74	26.38	3.26	2.97	3.47	2.99
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:

Alternative Mountain View C construction assumed to occur over 35 months, 22 days/month.

See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative Mountain View C would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Mountain View C would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative C would be less than significant.

Alternative Mountain View C would generate minimal short-term construction emissions and would therefore have a less-than-significant impact on air quality.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no construction activities would occur within the Alviso-A8 pond cluster. While limited O&M activities would be ongoing, they are considered part of project operation, not project construction. As such, no construction-generated emissions would occur.

Long-term operational air pollutant emissions are evaluated in Phase 2 Impact 3.13-2.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Implementation of Alternative A8 B would involve the creation of habitat transition zones. Construction activities would last approximately 8 months. Approximately 190,000 cy of material would be transported to the project area from off-site locations. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, and worker commute activity; and other miscellaneous activities.

As shown in Table 3.13-10, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative A8 B would conform to the SIP.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative A8 B would not conflict with the applicable air quality plan.

Table 3.13-10 Alternative A8 B Construction Emissions Summary

EMISSIONS	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.27	0.99	3.08	0.13	0.12	0.22	0.13
Construction (tons/year)	0.27	0.99	3.08	0.13	0.12	0.22	0.13
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	3.09	11.21	34.97	1.53	1.39	2.49	1.49
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:
Alternative A8 B construction assumed to occur over 8 months, 22 days/month.
See Appendix H for modeling input assumptions and output results.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative A8 B would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative B would be less than significant.

Alternative A8 B would generate minimal short-term construction emissions; therefore, it would have a less-than-significant impact.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no construction activities would occur within the Ravenswood pond cluster. While O&M activities would be ongoing, they are considered part of project operation, not project construction. As such, no construction-generated emissions would occur.

Long-term operational air pollutant emissions are evaluated in Phase 2 Impact 3.13-2.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Implementation of Alternative Ravenswood B would involve levee modifications and improvements, creation of tidal habitat, installation of water control structures, creation of a habitat island, and construction of recreational facilities. Construction activities would last approximately 5 months. Approximately 37,900 cy of material would be transported from off-site locations. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, and worker commute activity; and other miscellaneous activities.

As shown in Table 3.13-11, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed the applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Ravenswood B would conform to the SIP.

Table 3.13-11 Alternative Ravenswood B Construction Emissions Summary

EMISSIONS	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.16	0.68	1.72	0.07	0.07	0.09	0.07
Construction (tons/year)	0.16	0.68	1.72	0.07	0.07	0.09	0.07
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	2.82	12.28	31.19	1.33	1.21	1.65	1.24
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:
Alternative Ravenswood B construction assumed to occur over 5 months, 22 days/month.
See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative Ravenswood B would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Ravenswood B would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative B would be less than significant.

Alternative Ravenswood B would generate minimal short-term construction emissions and would therefore have a less-than-significant impact.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Implementation of Alternative Ravenswood C would involve levee modifications and improvements, creation of tidal habitat, installation of water control structures, creation of a habitat island, excavation of pilot channels, raising of pond bottoms, and construction of recreational facilities. Construction activities would last approximately 7 months. Approximately 210,400 cy of material would be transported to the project area from off-site locations. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, and worker commute activity; and other miscellaneous activities.

As shown in Table 3.13-12, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Ravenswood C would conform to the SIP.

Table 3.13-12 Alternative Ravenswood C Construction Emissions Summary

EMISSIONS	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.31	1.31	3.57	0.15	0.14	0.21	0.15
Construction (tons/year)	0.31	1.31	3.57	0.15	0.14	0.21	0.15
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	4.09	17.03	46.30	1.99	1.80	2.77	1.89
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:
Alternative Ravenswood C construction assumed to occur over 7 months, 22 days/month.
See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative Ravenswood C would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Ravenswood C would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative C would be less than significant.

Alternative Ravenswood C would generate minimal short-term construction emissions and would therefore have a less-than-significant impact.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Implementation of Alternative Ravenswood D would involve levee modifications and improvements, installation of water control structures, and construction of recreational facilities. Construction activities would last approximately 15 months. Because the designs for Alternative Ravenswood D plan for more cubic yards of material from cut activities than are required for fill activities, there would be a surplus of almost 15,000 cy of fill material on-site. This material could be used under Alternative D, and no net import of fill from off-site locations would be required. Construction activities would result in the temporary generation of emissions from earthmoving activities, exhaust from off-road equipment and worker commute activity, and other miscellaneous activities.

As shown in Table 3.13-13, construction-generated daily emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROG, CO, NO_x, and $PM_{2.5}$ would not exceed applicable de minimis thresholds for general conformity. Therefore, construction of Alternative Ravenswood D would conform to the SIP.

Table 3.13-13 Alternative Ravenswood D Construction Emissions Summary

EMISSION	ROG	CO	NO_x	PM_{10} (EXHAUST)	$PM_{2.5}$ (EXHAUST)	PM_{10} (TOTAL)	$PM_{2.5}$ (TOTAL)
Construction (total tons)	0.30	1.19	3.23	0.14	0.13	0.22	0.14
Construction (tons/year)	0.24	0.95	2.58	0.12	0.11	0.17	0.11
General conformity de minimis thresholds (tons/year)	50	100	100	—	—	—	100
Exceeds general conformity de minimis threshold?	No	No	No	—	—	—	No
Construction (lb/day)	1.81	7.22	19.55	0.87	0.80	1.31	0.84
BAAQMD thresholds (lb/day)	54	—	54	82	54	BMPs	BMPs
Exceeds BAAQMD threshold?	No	—	No	No	No	—	—

Notes:
Alternative Ravenswood D construction assumed to occur over 15 months, 22 days/month.
See Appendix H for modeling input assumptions and output results.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because construction-generated emissions would not exceed the thresholds of significance, Alternative Ravenswood D would not conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines.

Because construction activities associated with Alternative Ravenswood D would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from Alternative D would be less than significant.

Alternative Ravenswood D would generate minimal short-term construction emissions and would therefore have a less-than-significant impact.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.13-2: Potential long-term operational air pollutant emissions.

Alviso-Island Ponds

Alternative Island A (No Action). Alternative Island A (the No Action Alternative) would involve no new activities. The Island Ponds would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The level of activity would be the same as the activities occurring under existing conditions and would not result in a change in emissions. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternative Island A would not conflict with the applicable air quality plan.

Alternative Island A Level of Significance: Less than Significant

Alternatives Island B and Island C (Action Alternatives). The following discussion addresses Alternatives Island B and Island C (Action Alternatives). Operations under the Action Alternatives would be similar to operations under Alternative Island A. Based on the above discussion, the level of operational activity would be similar to existing conditions and would not result in a change in emissions. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternatives Island B and Island C (Action Alternatives) would not conflict with the applicable air quality plan.

Island Action Alternatives Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Operations under Alternative Mountain View A (the No Action Alternative) would involve limited O&M activities, such as levee repair and maintenance, maintenance of existing trails, replacement of water control structures, and implementation of the AMP. Water in Charleston Slough would continue to supply the water system at Shoreline Park’s sailing lake through the use of a pump. These activities would occur intermittently over the lifetime of the project. O&M activities would generate fugitive dust and other air emissions associated with the use of vehicles and other equipment. However, the level of activity would be the same as the O&M activities occurring under existing conditions and would not result in an increase in emissions compared to the existing O&M activities. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternative Mountain View A would not conflict with the applicable air quality plan.

Alternative Mountain View A Level of Significance: Less than Significant

Alternatives Mountain View B and Mountain View C (Action Alternatives). Under Alternatives Mountain View B and Mountain View C (Action Alternatives), operations would be similar to that described for Alternative Mountain View A, but might actually decrease overall because of the reduced need to maintain levees. Based on the above discussion, the level of operational activity would be similar to existing conditions and would not result in a substantial increase in emissions compared to the existing operational activity. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternatives Mountain View B and Mountain View C (Action Alternatives) would not conflict with the applicable air quality plan.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), operations would involve limited O&M activities, such as levee repair, replacement of water control structures, and implementation of the AMP. These activities would occur intermittently over the lifetime of the project. O&M activities would generate fugitive dust and other air emissions associated with the use of vehicles and other equipment. However, the level of activity would be the same as the O&M activities occurring under existing conditions and would not result in an increase in emissions compared to the existing operational activity. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternative A8 A would not conflict with the applicable air quality plan.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Alternative A8 B would involve constructing habitat construction zones in Pond A8S. Once complete, operations under Alternative B would be similar to those described for Alternative A8 A. Based on the above discussion, the level of operational activity would be similar to that of existing conditions and would not result in an increase in emissions compared to the existing operational activity. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternative A8 B would not conflict with the applicable air quality plan.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), operations would involve limited O&M activities, such as levee repair and implementation of the AMP. These activities would occur intermittently over the lifetime of the project. O&M activities would generate fugitive dust and other air emissions associated with the use of vehicles and other equipment. However, the level of activity would be the same as the O&M activities occurring under existing conditions and would not result in an increase in emissions compared to existing operational activities. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternative Ravenswood A would not conflict with the applicable air quality plan.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). Under Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives), operations would be similar to those described for Alternative Ravenswood A, though with reduced need for levee maintenance and increased trail maintenance and operation of water control structures. Based on the above discussion, the overall level of operational activity would be similar to that of existing conditions and would not result in a substantial increase in emissions compared to emissions under existing operational activity. Therefore, the impact from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives) would not conflict with the applicable air quality plan.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Phase 2 Impact 3.13-3: Potential exposure of sensitive receptors to TAC emissions.

Alviso-Island Ponds

Alternative Island A (No Action). Alternative Island A (the No Action Alternative) would not require construction activities within the ponds. O&M activities could require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternatives Island B and Island C (Action Alternatives). Under Alternatives Island B and Island C (Action Alternatives), construction would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Sensitive receptors are approximately 8,000 feet east of the pond cluster. Because of the distance of the sensitive receptors and the temporary use of off-road construction equipment, short-term construction activities would not expose sensitive receptors to substantial TAC emissions. Soil disturbance during construction activities (including mass grading and excavation) may result in airborne entrainment of toxic contaminants in fugitive dust, and as such may expose workers and nearby sensitive receptors to potentially toxic air emissions, although the concentrations of these contaminants in fugitive dust emissions are not anticipated to reach levels that may present significant risks. Project design features would include requirements for the preparation of a Health and Safety Plan to reduce the potential for workers and nearby residents to be exposed to airborne TACs.

O&M activities could require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project. Further, there are no sensitive receptors nearby. As such, potential exposure of sensitive receptors to TAC emissions during operations would not occur. Because of the distance to sensitive receptors, the limited duration of construction activities, the preparation of a Health and Safety Plan, and the intermittent nature of operational activities, impacts to sensitive receptors under Alternatives Island B and Island C (Action Alternatives) would be less than significant.

Island Action Alternatives Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Alternative Mountain View A (the No Action Alternative) would not require construction activities within the ponds. O&M activities could require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternatives Mountain View B and Mountain View C (Action Alternatives). Under Alternatives Mountain View B and Mountain View C (Action Alternatives), construction would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Sensitive receptors are approximately 3,000 feet southwest of the pond cluster. Because of the distance of the sensitive receptors and the temporary use of off-road construction equipment, short-term construction activities would not expose sensitive receptors to substantial TAC emissions.

As described above in the impact discussion for Alternatives Island B and Island C, project design features would include requirements for the preparation of a Health and Safety Plan that would reduce the potential for workers and nearby residents to be exposed to airborne TACs entrained in fugitive dust during construction.

O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent, occur intermittently over the lifetime of the project, and not substantially differ from equipment use for existing O&M activities. As such, potential increases in exposure of sensitive receptors to TAC emissions during operations would not occur.

Because of the distance to sensitive receptors, the limited duration of construction activities, the preparation of a Health and Safety Plan, and the intermittent nature of operational activities, impacts to sensitive receptors under Alternatives Mountain View B and Mountain View C (Action Alternatives) would be less than significant.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Alternative A8 A (the No Action Alternative) would not require construction activities within the ponds. O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, construction would result in short-term diesel exhaust emissions from on-site heavy-duty equipment used to construct the habitat transition zones. Sensitive receptors are approximately 600 feet east of the pond cluster. Construction activities within the project boundaries would occur at the southern portions of the pond cluster, which are over 1,500 feet from these receptors. BAAQMD guidance states that a site screening should be conducted to determine if the project would result in receptors being within 1,000 feet of a PM or TAC source. Because of the distance of the sensitive receptors from the construction activities and the temporary nature of the use of off-road construction equipment, short-term construction activities would not expose sensitive receptors to substantial TAC emissions.

As described in the impact discussion for Alternatives Island B and Island C, project design features would include requirements for the preparation of a Health and Safety Plan, which would reduce the potential for workers and nearby residents to be exposed to airborne TACs entrained in fugitive dust during construction.

O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent, occur intermittently over the lifetime of the project, and not substantially differ from existing O&M activities. As such, potential increases in exposure of sensitive receptors to TAC emissions during operations would not occur.

Because of the distance of the construction activities to sensitive receptors, the limited duration of construction activities, the preparation of a Health and Safety Plan, and the intermittent nature of operational activities, impacts to sensitive receptors under Alternative A8 B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Alternative Ravenswood A (the No Action Alternative) would not require construction activities within the ponds. O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). The following discussion addresses Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). Construction under these alternatives would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Sensitive receptors are approximately 1,000 feet southwest of the pond cluster boundary. BAAQMD recommends that a site screening should be conducted to determine if the project would result in receptors being within 1,000 feet of a PM or TAC source. Construction would occur throughout the 625-acre pond cluster project site and many construction activities would be at distances much greater than 1,000 feet from these receptors. A health risk screening analysis was performed to evaluate potential impacts on sensitive receptors from diesel PM emissions from construction activities. The screening analysis was performed using BAAQMD-recommended methodologies for air dispersion screening modeling and health risk calculations (BAAQMD 2012b). The analysis used the air dispersion screening model AERSCREEN, which conservatively evaluates worst-case meteorology conditions. Details of the screening health risk analysis can be found in Appendix H. This screening assessment indicated that risks from construction activities under Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives) would not exceed the BAAQMD health risk and hazard thresholds. Therefore, short-term construction activities would not expose sensitive receptors to substantial TAC emissions.

As described in the impact discussion for Alternatives Island B and Island C, project design features would include requirements for the preparation of a Health and Safety Plan, which would reduce the potential for workers and nearby residents to be exposed to airborne TACs entrained in fugitive dust during construction.

O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent, occur intermittently over the lifetime of the project, and not substantially differ from existing O&M activities. As such, potential increased exposure of sensitive receptors to TAC emissions during operations would not occur.

Based on the results of the health risk screening analysis for construction emissions, the preparation of a Health and Safety Plan, and the intermittent nature of operational activities, impacts to sensitive receptors from Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives) would be less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Phase 2 Impact 3.13-4: Potential odor emissions.

Odors can occur in the existing ponds in two ways. First, algae and other biomass that naturally grow in the ponds can accumulate in certain areas of the ponds. As the algae naturally decompose, H_2S gas can be produced, generating odors. Warm weather and lack of wind can accelerate the decomposition in the ponds and aggravate the odorous condition. Second, odors can develop as the ponds dry and the mud bottoms are exposed to air, especially in hot weather. These odors are caused by the exposure of algae or brine shrimp that are found in some of the salt ponds.

The occurrence of an odor depends to a large part on the number of degree-cooling days that occur in summer months. The potential for odor-related impacts is also dependent on prevailing winds and the proximity and location of downwind receptors. Although offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A (the No Action Alternative), no construction activities would occur and O&M activities would be limited. This alternative would be a continuation of existing conditions—that is, no new activities would occur at the pond cluster. Ponds would be expected to continue transitioning toward tidal marsh, which is not anticipated to substantially change pond conditions that affect the potential for odors. As such, the potential for odors under this alternative would not change from that under existing conditions and would result in a less-than-significant impact.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Construction under Alternative Island B would result in diesel emissions from the exhaust of on-site equipment, which may be odorous. Such emissions would be intermittent and would dissipate rapidly from the source. Also, mobile diesel-powered equipment would only be present on-site temporarily during construction activities. As such, construction would not create objectionable odors affecting a substantial number or people. This impact would be less than significant.

After construction activities are completed, Ponds A19 and A20 would receive additional tidal action than occurs under existing conditions. Under Alternative Island B, ponds would be expected to continue transitioning toward tidal marsh, which is not anticipated to substantially change pond conditions that affect the potential for odors. The potential for odors is expected to continue with Alternative B , but it would not result in the creation of new odors affecting a substantial number of people and would thus result in a less than significant impact.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C is similar to Alternative Island B with the exception that Alternative C would also increase tidal activity in Pond A21. Under Alternative C, ponds would be expected to continue to transition to tidal marsh, which is not anticipated to substantially change pond conditions that affect the potential for odors. Thus, as with Alternative Island B, Alternative C would result in a less-than-significant impact.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), no construction activities would occur and O&M activities would be limited. Alternative A would be a continuation of existing conditions. Alternative A would not result in changes to pond conditions that would affect the potential for odor. As such, the potential for odors is expected to continue with Alternative A, and no new activity would occur that would create objectionable odors. As such, the potential for odors under Alternative A would not change from under existing conditions and would result in a less-than-significant impact.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Diesel exhaust from on-site equipment during construction may be odorous, but emissions would be intermittent and would dissipate rapidly from the source, resulting in less-than-significant impacts.

Under Alternative Mountain View B, Ponds A1 and A2W would be reconfigured, and the tide would circulate within them such that stagnation of the ponds would not occur. As such, odors from these ponds would decrease compared to existing condition. Alternative B would not result in changes to Charleston Slough, and the potential for odors to be generated at Charleston Slough would not change compared to the potential under existing conditions. As such, potential odor impacts to sensitive receptors would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Alternative Mountain View C is similar to Alternative Mountain View B in terms of odor effects. Under Alternative C, Charleston Slough would also transition to a tidal marsh. Similar to Alternative B, the increase in tidal flushing in the pond cluster would result in a decrease in odor compared to existing conditions. As such, potential odor impacts to sensitive receptors would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A (the No Action Alternative), no construction activities would occur, and O&M activities would not change from the existing condition. Alternative A would not result in changes to pond conditions that would affect the potential for odor. The potential for odors is expected to be unchanged with Alternative A, and the impact would be less than significant because odor effects would not be different from those under existing conditions.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Diesel exhaust from on-site equipment during construction may be odorous, but emissions would be intermittent and would dissipate rapidly from the source, resulting in a less-than-significant impact.

Alternative A8 B would not result in changes to pond conditions that would affect the potential for odor. The potential for odors is expected to continue with Alternative B, but the impact would be less than significant because odor effects would be similar to those under existing conditions. Potential odor impacts to sensitive receptors would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no construction activities would occur and O&M activities would be limited. Alternative B would be a continuation of existing conditions, that is, continued operation of the ponds. Alternative B would not result in changes to pond conditions that would affect the potential for odor. The potential for odors is expected to be unchanged with Alternative A, but the impact would be less than significant because odor effects would not be different from existing conditions.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Diesel exhaust from on-site equipment during the construction of Alternative Ravenswood B may be odorous, but emissions would be intermittent and would dissipate rapidly from the source, resulting in less-than-significant impacts.

Under Alternative Ravenswood B, Ponds R4, R5 and S5 would have increased circulation over the baseline condition, such that stagnation or seasonal drying of the ponds would not occur. This increase in water circulation would be expected to decrease the potential for odors over time. There is some potential for dissolved oxygen problems and related odors in Ponds R5 and S5; however, active monitoring and management would allow water to be circulated through these ponds as needed to avoid the effects. Pond R3 would not be changed from its current condition. Because of the increased circulation of water in most of the pond cluster, potential odor impacts to sensitive receptors would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Alternative Ravenswood C is similar to Alternative Ravenswood B in terms of potential odor impacts. However, the operation of Ponds R5 and S5 as intertidal mudflat would avoid the odors associated with low dissolved oxygen there. Further, in Pond R3, the ability to increase water circulation would be improved and the potential of odors resulting from stagnation or pond drying would be reduced. As such, potential odor impacts to sensitive receptors under this alternative would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Alternative Ravenswood D is similar to Alternative Ravenswood B in terms of odor effects. Adequate water circulation would be expected to decrease the potential for odors. As such, potential odor impacts to sensitive receptors would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.13-14. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP, and other Don Edwards San Francisco Bay National Wildlife Refuge management practices and documents. The air quality analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.13-14 Phase 2 Summary of Impacts – Air Quality

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.13-1: Short-term construction-generated air pollutant emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.13-2: Potential long-term operational air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-3: Potential exposure of sensitive receptors to TAC emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-4: Potential odor emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.14 Public Services

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing public services within the Phase 2 area of the South Bay Salt Pond (SBSP) Restoration Project and analyzes whether implementation of the project would cause a substantial adverse effect on public services. The information presented is based on a review of existing public services within the area and on other pertinent state and local regulations, which are presented in the regulatory setting section. Using this information as context, an analysis of environmental impacts of the project related to public services is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of this project. Therefore, this section only includes additional mitigation measures as needed.

3.14.1 Physical Setting

Methodology

This section presents information on public services and utilities in the Phase 2 area of the SBSP Restoration Project. Public services include police, fire, and emergency services. Schools and solid waste services are also discussed. Background information was drawn from applicable regional and local general plans and policies as well as from public service and utility representatives.

Regional Setting

In the South Bay, public services such as police, fire, and emergency services are primarily provided by each local jurisdiction. These services are described below. Emergency response staffing and ratios are provided but are for informative purposes only and should not be used to determine adequacy of service. In most jurisdictions, adequacy of service is determined by response time, with an ideal response time set at around 4 minutes. Jurisdictions strive to maintain appropriate staff levels to achieve this goal.

Project Setting

The settings of each of the four pond clusters included in Phase 2 are discussed below.

Alviso – Island Ponds

The Island Ponds (Ponds A19, A20, and A21) are located in Alameda County, the southern border of which runs through the center of Coyote Creek, immediately to the south of these ponds. They are west and south of the city of Fremont.

Alameda County

Police Services. The Alameda County Sheriff’s Department has a main administration office at 1401 Lakeside Drive in Oakland; the Eden Township substation is located at 15001 Foothill Boulevard in San Leandro. The Sheriff’s Department provides police services to the unincorporated areas of Alameda.

There are several specialized units and teams within the Sheriff's Office. These include Animal Control, the Coroner’s Bureau, Court Services, Crime Labs, and Homeland and Emergency Services. The Sheriff's Office hosts or participates in several joint-agency task forces (Alameda County 2015).

Fire Protection and Emergency Services. The Alameda County Fire Department does not provide fire protection services to the Phase 2 area of the SBSP Restoration Project. The Phase 2 area would be served by the City of Fremont Fire Department.

Schools. Alameda County does not have its own school district but consists of school districts that are located within incorporated cities (e.g., Oakland, Union City, and Fremont). Please refer to the discussions below for the City of Fremont.

Solid Waste. The Tri-Cities Landfill in Fremont provides garbage collection and disposal.

Fremont

Police Services. The City of Fremont Police Department provides police protection services within the city of Fremont, which includes areas immediately south of the area of the SBSP Restoration Project. The Police Department is headquartered at 2000 Stevenson Boulevard in the city of Fremont. For emergency calls, Fremont police response time is 3 minutes or less. Currently, the police force consists of 191 authorized sworn officers and 72 support personnel; the service ratio is 0.89 officers per 1,000 residents.

Fire Protection and Emergency Services. The Fremont Fire Department provides emergency fire protection, prevention, rescue, and emergency medical services to the city of Fremont, including the areas immediately surrounding the SBSP Restoration Project Phase 2 area. The Fremont Fire Department Administration Offices are located at 3300 Capitol Avenue in Fremont. With a service area of 92 square miles and a service population of approximately 208,000, the Fremont Fire Department currently maintains 12 in-service fire companies and 11 stations located in Fremont. The Fremont Fire Department provides emergency fire protection, prevention, rescue, and emergency medical services to the city of Fremont and to the Alviso–Island pond cluster. Station Number 5, located at 55 Hackamore Lane in Fremont, is the closest to the Alviso–Island pond cluster and would respond if there is an emergency. Station Number 5 includes an engine company, a patrol unit, and a hazardous materials response unit.

Schools. The Fremont Unified School District provides public education in Fremont for kindergarten through grade 12. The school district has 29 elementary schools, 5 middle schools, 6 high schools, as well as 1 adult school in the city. No schools are located within the area of the SBSP Restoration Project.

Solid Waste. The City of Fremont administers a contract with Allied Waste Services for the collection and disposal of residential and commercial waste and recycling.

Alviso – Mountain View Ponds

The Mountain View Ponds (Ponds A1 and A2W) are located bayward of the city of Mountain View. Charleston Slough, which is included in Alternative Mountain View C, is actually within the city limits. Also, the City of Palo Alto’s flood control basin and its associated levees are immediately to the west. Both Mountain View and Palo Alto are in Santa Clara County.

Santa Clara County

Police Services. The Santa Clara County Sheriff’s Department is headquartered at 55 West Younger Avenue in San Jose; a substation is located at 80 West Highland Avenue in San Martin. The Sheriff’s Department provides police services to the unincorporated areas of Santa Clara County, including the area of the SBSP Restoration Project. The Sheriff’s Department has 554 full-time, sworn enforcement staff. In addition to the full-time badge staff, the Santa Clara County Sheriff's Department has 65 reserve deputy sheriffs. To support the entire operation, it employs 426 non-sworn civilian staff. The Sheriff's Department does not maintain a service standard based on officers per residents, but rather one based on the number of calls for service.

There are several specialized units and teams within the Sheriff's Office. These include Community Relations, Canine Unit, Search & Rescue (including Mounted), Dive Team, Traffic/Motorcycles, Off-Road Enforcement Team, Hostage Negotiation Team, Sheriff's Emergency Response Team, Crowd Control Unit, Intelligence/Vice, and Bomb Squad. The Sheriff's Office hosts or participates in several joint-agency task forces (Santa Clara County Sheriff 2015).

Fire Protection and Emergency Services. The Santa Clara County Fire Department does not provide fire protection services to the area of the SBSP Restoration Project. The portion of unincorporated Santa Clara County located in the Phase 2 area would be served by the City of Mountain View Fire Department.

Schools. Santa Clara County does not have its own school district, as school districts are located within incorporated cities (e.g., Sunnyvale, San Jose, and Mountain View). Please refer to the discussions below.

Solid Waste. Recology provides garbage collection and disposal as well as recycling services to residential and commercial users in the unincorporated portion of north Santa Clara County.

Mountain View

Police Services. The City of Mountain View Police Department is headquartered at 1000 Villa Street in Mountain View. The Police Department currently employs 97 sworn police officers (City of Mountain View Police 2013). Based on a population of 75,275, the service ratio of officers to residents is 1.3 officers per 1,000 residents.

Fire Protection and Emergency Services. The City of Mountain View Fire Department serves an evening population of 75,275 with 85 full-time, permanent positions across three divisions (City of Mountain View Police 2013). There are 69 firefighters, including 3 battalion chiefs. The Department has five fire stations located throughout the city. Each has an engine, and Station 1 also has a truck-and-rescue unit. The closest station to the SBSP Restoration Project Phase 2 area is Station 5, located at 2196 North Shoreline Boulevard in Mountain View. Station 5 would be the first to respond in the case of an emergency within the Alviso–Mountain View pond cluster.

Schools. The Mountain View Whisman School District provides public education in Mountain View for kindergarten through grade 8 (K-8) (MVWSD 2015). Mountain View has seven elementary schools and two middle schools within the city. No schools are located within the area of the SBSP Restoration Project. The Mountain View Los Altos High School District provides public education in the cities of Mountain View and Los Altos for grades 9 through 12 (MVLAHSD 2015). The school district has two high schools, one of which is located in Mountain View.

Solid Waste. Recology provides garbage collection, disposal, and recycling services for residential and commercial users within the city of Mountain View.

Alviso – A8 Ponds

The Alviso-A8 pond cluster (also referred to as the A8 Ponds) consists of Ponds A8 and A8S and the levees surrounding each pond. This pond cluster is located in the southern portion of the 25-pond Alviso pond complex. The pond cluster is located between Guadalupe Slough and Alviso Ponds A5 and A7 to the west; Sunnyvale Baylands County Park, Guadalupe Slough and San Tomas Aquino Creek to the south; and Alviso Slough to the east and north. The ponds are located within the city of San Jose.

Santa Clara County

Santa Clara County public services were previously described in the discussion of the Mountain View Ponds.

San Jose

Police Services. The San Jose Police Department is headquartered at 201 West Mission Street in San Jose and employs more than 1,000 sworn officers in 4 bureaus comprised of 11 divisions with more than 50 specialized units and assignments. The A8 Ponds are located within the jurisdiction of the Central Division, which includes four patrol districts totaling approximately 39 square miles. The four patrol districts encompass the businesses and high-density housing of Downtown San Jose and extend north to the Alviso Marina at the southern tip of San Francisco Bay (City of San Jose 2015).

Fire Protection and Emergency Services. The City of San Jose Fire Department (SJFD) serves a population of over 1 million with 679 authorized sworn police officers and 112 civilian personnel (City of San Jose 2013). The SJFD responds to all fires, hazardous materials spills, and medical emergencies (including injury accidents) in San Jose. The SJFD has a total of 33 stations, and the closest to the Phase 2 area is Station 25, located at 5125 Wilson Way.

Schools. The San Jose Unified School District provides public education in the city for kindergarten through grade 12. The school district has 25 elementary schools, 2 K-8 schools, 6 middle schools, and 9 high schools. No schools are located within the area of the SBSP Restoration Project.

Solid Waste. Recology provides garbage collection and disposal as well as recycling services to residential and commercial users in San Jose.

Ravenswood Ponds

The Ravenswood pond cluster is located north of State Route (SR) 84 and is adjacent to the city of Menlo Park; the pond cluster is also bordered to the northwest by Redwood City.

Menlo Park

Police Services. The Menlo Park Police Department (MPPD) provides police protection services within the incorporated city of Menlo Park, including the Ravenswood pond cluster. Outside city boundaries, the San Mateo County Sheriff's Department, based in Redwood City, and the California Highway Patrol (CHP) have jurisdiction. The CHP patrols highways that pass through Menlo Park, including Interstate-280, U.S. Highway 101, and El Camino Real (SR 82), while the Sheriff's Department patrols county-controlled roads and responds to calls in the unincorporated areas adjacent to Menlo Park.

The MPPD is headquartered at 701 Laurel Street in the Menlo Park Civic Center. The Belle Haven Substation is located at 1197 Willow Road and is the closer of the two stations to the Ravenswood pond cluster. For emergency calls, the MPPD's response time is 3 minutes or less. Non-emergency requests for service are generally answered within 15 minutes. The MPPD includes 47 sworn officers and 22 professional staff, resulting in a total full-time equivalent of 68.75 as of 2012. The sworn officers include 1 chief, 2 commanders, 8 sergeants, and 36 police officers, and the staffing ratio is 1.4 officers per 1,000 residents (City of Menlo Park 2014).

Fire Protection and Emergency Services. The Menlo Park Fire Protection District (MPFPD) provides fire protection services to Menlo Park, portions of Atherton, East Palo Alto, and adjacent unincorporated portions of San Mateo County and includes the Ravenswood pond cluster. With a service area of approximately 30 square miles and a service population of 93,000, the MPFPD currently maintains seven stations located in Menlo Park, East Palo Alto, and Redwood City, and employs a staff of 83 trained firefighters (City of Menlo Park 2013).

The MPFPD maintains five stations in Menlo Park, including Fire Department Headquarters. The headquarters is equipped with a command vehicle, one hook-and-ladder truck, and one rescue unit. The remaining stations in Menlo Park each have one engine. Fire Station Number 77, located at 1467 Chilco Avenue in Menlo Park, is the closest station to the Ravenswood pond cluster and would be the first to respond in the case of an emergency call from within the pond cluster.

Schools. The Menlo Park Elementary School District serves parts of Menlo Park, Atherton, and unincorporated San Mateo County. It has one elementary and one middle school in the city of Menlo Park (Menlo Park City School District 2015). The Ravenswood City School District (RCSD) also provides K-8 public education to Menlo Park students, and has three elementary schools (RCSD 2015). The Menlo-Atherton High School of the Sequoia Union High School District provides secondary education to the City of Menlo Park. No schools are located within the area of the SBSP Restoration Project.

Solid Waste. Recology provides garbage collection, disposal, and recycling services for residential and commercial use within the city of Menlo Park.

Redwood City

Police Services. Police protection services for all of Redwood City are provided by the Redwood City Police Department (RCPD), which is headquartered at 1301 Maple Street. The RCPD is separated into three divisions: 1) Administrative Division, 2) Investigations Division, and 3) Patrol Division. Each of the three divisions supports its own initiatives and programs. The RCPD sets a standard of responding to emergency calls and arriving on scene within 5 minutes (City of Redwood City 2010). The RCPD has a total of 94 total sworn officers and numerous support staff (City of Redwood City 2015a).

Fire Protection and Emergency Services. The Redwood City Fire Department (RCFD) includes seven fire stations housing seven engines, one truck, and one battalion chief. It currently has over 90 staff members, including firefighters, firefighter/paramedics, captains, battalion chiefs, fire prevention staff, training staff, and administrative staff (City of Redwood City 2015b). The RCFD is responsible for the safety of everyone within the city's borders, an area totaling 34.6 square miles—19.5 square miles on land and 15.1 square miles in the water. Automatic mutual aid is provided by the California Department of Forestry and Fire Protection and the adjacent cities of Menlo Park, Woodside, Belmont, and San Carlos. The RCFD is responsible for fire prevention and suppression, medical response, and property protection, and places a high priority on quick response. Its goal is to respond to emergency calls within 5 to 7 minutes (Redwood City 2010). Local response times to emergency situations are currently exceeding the RCFD's internal standards.

Schools. The Redwood City School District serves Redwood City and portions of San Carlos, Menlo Park, Atherton, Woodside, and unincorporated San Mateo County. The school district provides K-8 public education in parts of Menlo Park, Atherton, and unincorporated San Mateo County, and has three elementary schools (RWCSD 2015). The Sequoia Union High School District provides secondary education in Redwood City. No schools are located within the area of the SBSP Restoration Project.

Solid Waste. Recology provides garbage collection, disposal, and recycling services for residential and commercial use within Redwood City.

Regulatory Setting

This section provides the regulatory background necessary to analyze the effects on public services associated with areas in and around the ponds in Phase 2 of the SBSP Restoration Project. Applicable local and regional plans and policies were reviewed for information on existing land uses and policies.

Alviso – Island Ponds

County of Alameda. The County of Alameda Countywide Safety Element (County of Alameda 2013) provides guidance to minimize human injury, loss of life, property damage, and economic and social dislocation due to natural and man-made hazards. Goal #6 of the Safety Element identifies the need to prepare and keep current Alameda County emergency procedures in the event of a potential natural or man-made disaster.

Fremont. The City of Fremont General Plan (City of Fremont 2003) includes the following relevant public services strategies, policies, and implementation measures:

> <u>Water, Flood, and Sanitary Sewer Services</u>
>
> *Implementation 3*: Work with the Alameda County Flood Control District to develop flood control measures that provide protection from flooding while preserving natural plant formations and natural topographic features.

Alviso – Mountain View Ponds

County of Santa Clara. The *Santa Clara County General Plan, 1995-2010* (County of Santa Clara 1994) provides public services-related strategies and policies that are associated primarily with new (urban) development and that as such are not related to the SBSP Restoration Project. Strategy #4 of the *Santa Clara County General Plan, 1995-2010* identifies the need to improve quality of life for all segments of the population. Policy C-EC 8(g) recognizes the need for providing adequate and efficient public services.

Mountain View. The *City of Mountain View 1992 General Plan* (City of Mountain View 1992) identifies the mission of the Mountain View Fire Department, which is "to prevent deaths, injuries, property losses, and environmental damage from fire, natural disasters, and uncontrolled release of toxic substances."

Relevant fire strategies, policies, and implementation include:

> <u>Action 34.e</u>: Adopt and enforce proactive fire and life-safety codes that require property owners to share in the responsibility for fire protection services.
>
> <u>Action 34.f</u>: Review development plans to be sure there is adequate access for emergency vehicles.
>
> <u>Action 34.g</u>: Develop weed abatement programs that reduce the risk of fire while maintaining habitat value for native plants and animals.
>
> <u>Action 35.c</u>: Maintain enough firefighters per shift to meet publicly accepted levels of risk and response expectations.

Action 35.d: Continue to participate in county-wide and state-wide mutual aid and automatic aid programs with neighboring cities.

Action 35.f: Maintain a water supply and water pressure that can meet potential firefighting demands.

Action 37.d: Strengthen construction requirements where hazardous materials are stored or used.

Action 38.a: Require an assessment of the past use of hazardous materials on proposed development sites.

The *City of Mountain View 1992 General Plan* (City of Mountain View 1992) states that the Mountain View Police Department is responsible for maintaining quality of life by protecting people and property, promoting community order through crime prevention and educational programs, apprehending and prosecuting criminals, and regulating non-criminal activities.

Relevant police strategies, policies, and implementation include:

Action 40.a: Maintain a force sufficiently staffed and deployed to sustain a 4-minute maximum emergency response 70 percent of the time.

Alviso – A8 Ponds

County of Santa Clara. The *Santa Clara County General Plan, 1995-2010* (County of Santa Clara 1994) provides relevant strategies and policies for public services associated primarily with new (urban) development and as such are not related to the SBSP Restoration Project. Strategy #4 of the *Santa Clara County General Plan, 1995-2010* identifies the need to improve quality of life for all segments of the population. Policy C-EC 8(g) recognizes the need for providing adequate and efficient public services.

San Jose. The *City of San Jose 2040 General Plan* (City of San Jose 2011) identifies the following relevant public services policy:

ES-4.2: Provide for continued essential emergency public services during and following natural or human-made disasters to mitigate their impacts and to help prevent major problems during post-disaster response, such as evacuations, rescues, large numbers of injuries, and major cleanup operations.

Ravenswood

Menlo Park. The *City of Menlo Park General Plan: Policy Document* (City of Menlo Park 1994) does not provide relevant goals or policies associated with public services, and neither does the 2004 Menlo Park Municipal Code.

Redwood City. The *Redwood City General Plan* (City of Redwood City 2010) includes the following relevant public services strategies, policies, and programs:

Policy PS-7.3: Strive to maintain the structural and operational integrity of essential public facilities during flooding. Locate, when feasible, new, essential public facilities outside of flood hazard zones; identify construction methods or other methods to minimize damage if these facilities are located in flood hazard zones. Essential public facilities include city government operations facilities, police and fire facilities, and hospitals.

Policy PS-11.1: Work with the Police Department to determine and meet community needs for law enforcement services.

Policy PS-11.2: Work with the Fire Department to determine and meet community needs for fire protection and related emergency services.

Program PS-32: **Emergency Operations Plan.** Review and update, as needed, the City's emergency operations plan in coordination with the County's natural disaster-preparedness plan to address disasters such as earthquakes, flooding, dam or levee failure, hazardous materials spills, epidemics, fires, extreme weather, major transportation accidents, and terrorism.

Program PS-34: **Emergency Aid Standing Agreements.** Maintain standing agreements with other public and private agencies to furnish specified aid upon demand in the event of a major emergency, as appropriate.

Program PS-39: **Adequate Police and Fire Departments Service Requirements.** Provide funding for the Police Department and Fire Department to maintain sufficient personnel and the highest level of technology and equipment to meet the service requirements of new growth and other specific needs, as appropriate.

Program PS-42: **Emergency Evacuation Routes and Plans.** Prepare and regularly update emergency evacuation routes and plans.

3.14.2 Environmental Impacts and Mitigation Measures

Significance Criteria

For the purposes of this Final EIS/R, a significant impact on public services would occur if the project would:

- Result in substantial adverse physical impacts associated with the need for provision of new or physically altered government facilities, the construction of which could cause a reduction in acceptable service ratios, response times, or other performance objectives for the following: parks, fire and police protection, public facilities, and schools;
- Generate a large volume of waste materials that could exceed the capacity of the local landfill(s);
- Breach federal, state, and local statutes and regulations related to solid waste.

As explained in Section 3.1.2, while both Council on Environmental Quality (CEQ) Regulations for implementing National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.14.2 above, and not on the proposed conditions that would occur under the No Action Alternative.[1] This approach mimics what was done for the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R). In this case, the No Action

1 No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This Final EIS/R uses No Action throughout.

Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) management documents and practices.

The SBSP Restoration Project does not propose and would not require the construction of new or altered schools or public facilities; therefore, no impacts to these facilities or reduction in performance objectives would occur. Increased demand for fire and police protection services is discussed below in Phase 2 Impact 3.14-1. In addition, the project would not require substantial disposal of spoils that would exceed the capacity of local landfills. As described in Chapter 2, Alternatives, no construction would occur and only limited operations and maintenance activities would be required for the No Action Alternative at each pond cluster (Alternative Island A, Alternative Mountain View A, Alternative A8 A, and Alternative Ravenswood A).

Under the various Action Alternatives, a combined total of up to a few million cubic yards of dirt and soil could be imported on-site to improve or raise the proposed levees that provide flood protection or to construct habitat transition zones, habitat islands, or other features. Under the Phase 2 actions, all soils would be reused on-site. Under all Phase 2 alternatives, no off-site disposal of soils is expected. On the contrary, the project intends to be a recipient of clean dirt and other upland fill material from off-site construction projects. As such, the project is not expected to reduce local landfill capacity, and it may even slow the rate of background capacity loss. Further, the Phase 2 project would not break federal, state, and local statutes and regulations related to solid waste under any of the alternatives.

Program-Level Evaluation

The 2007 EIS/R evaluated the potential impact to public services of three long-term alternatives, which were each determined to have less-than-significant impacts to public services, including a potential increase in the demand for fire and police protection services. Three programmatic-level alternatives were considered and evaluated in the 2007 EIS/R: (A) the No Action Alternative, (B) the Managed Pond Emphasis, and (C) the Tidal Habitat Emphasis. At the program level, the decision was made to select Alternative C and implement Phase 1 actions. Programmatic Alternative C has been carried forward as Alternative A (No Action) in this Final EIS/R, as it represents the continuation of existing conditions that would occur absent the implementation of one of the Action Alternatives for Phase 2.

Project-Level Evaluation

Phase 2 Impact 3.14-1: Increased demand for fire and police protection services.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, the Alviso-Island pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current United States Fish and Wildlife Service (USFWS) practices. No recreation facilities exist within the pond cluster, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Alternative Island B would breach the northern levee of Pond A19 and also remove or lower portions of the levees around Ponds A19 and A20 to support hydrological connectivity and potentially improve the ecological function of both ponds. No recreation facilities exist within the pond cluster, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Alternative Island C would include all of the components of Alternative Island B with the addition of three components: levee breaches on the north sides of Ponds A20 and A21, pilot channels in Pond A19, and widening of the existing breaches on the southern levee of Pond A19. No recreation facilities exist within the pond cluster, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, the Alviso-Mountain View pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Under Alternative Mountain View B, Ponds A1 and A2W would be breached at several points to introduce tidal flow in the ponds, and recreational opportunities would be increased through the construction of a new trail, a viewing platform, and a viewing platform. Existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained. An increase in the use of additional recreation and public access facilities as well as the currently existing ones may incrementally increase demand for fire and police protection services, including USFWS law enforcement. The construction of Phase 2 actions would result in limited new recreation facilities. These facilities are primarily extensions of existing services (e.g., viewing platforms, trails) and are not expected to substantially increase the need for fire and police protection services such that new facilities or additional staff would be required. The proposed recreation facilities would be designed in a manner that would facilitate the movement of emergency service providers in the event of an emergency (e.g., trails would be wide enough to accommodate vehicles and the provision of entrances). These actions would not be expected to increase the need for fire and police protection services to such an extent as to cause a reduction in acceptable response time or to outpace natural growth in the region and require construction of new fire and police stations as part of the SBSP Restoration Project. Therefore, the potential impacts would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Under Alternative Mountain View C, Pond A1, Pond A2W, and Charleston Slough would be converted to tidal marsh, and recreational opportunities would be increased through construction of new trails and viewing platforms. Existing trails on many of the levees along the boundary of the pond cluster would continue to be maintained. Impacts would be the same as for Alternative Mountain View B.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, the pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. No recreation facilities exist within the pond cluster, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase the demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Under this alternative, habitat transition zones may be constructed in Pond A8S's southwest corner, southeast corner, or both. As in the Mountain View Ponds, the habitat transition zones would perform several functions: adding some flood protection, buffering against sea-level rise, adding habitat transition zones for the salt marsh harvest mouse and Ridgway's rail, and protecting the adjacent landfill. No recreation facilities exist within the pond cluster, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, the Ravenswood pond cluster would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Ponds R3, R4, and R5/S5 would function as seasonal ponds. The outboard levees along Ponds R4 and R3 provide inland flood protection and would continue to be maintained or repaired as a component of the United States Army Corps of Engineers 1995 operations and maintenance permit. Existing trails on the levees along the southerly boundary of the pond cluster and along the boundary with Bedwell Bayfront Park would continue to be maintained, and no new recreation facilities would be provided. No substantial increase in visitor use resulting from the implementation of this alternative is expected that would in turn increase demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them. Consequently, there would be no impact.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Under Alternative Ravenswood B, Ponds R5 and S5 would become managed ponds of moderate depth for ducks and small shorebirds, Pond R3 would be enhanced for western snowy plover habitat, and Pond R4 would become tidal marsh. The changes proposed under this alternative would provide additional flood protection, improve habitat, and improve recreation and access. Existing trails along the southern boundary of the pond cluster and along the boundary with Bedwell Bayfront Park would continue to be maintained**.** A viewing platform would be constructed on an existing trail near Ponds R5 and S5 to improve public access and environmental education benefits at the adjacent wildlife habitat in Ponds R5 and S5. By incorporating environmental education opportunities at these ponds, this action would provide the public with enhanced recreational experiences at the relatively high-use Bedwell Bayfront Park in Menlo Park.

An increase in the use of additional recreation and public access facilities as well as the currently existing ones may incrementally increase demand for fire and police protection services, including USFWS law enforcement. The construction of Phase 2 actions would result in some new recreation facilities. These facilities are primarily extensions of existing services (e.g., viewing platforms) and are not expected to substantially increase the need for fire and police protection services such that new facilities or additional staff would be required. The proposed recreation facilities would be designed in a manner that would facilitate the movement of emergency service providers in the event of an emergency (e.g., trails would be wide enough to accommodate vehicles and the provision of entrances). These alternatives would not be expected to increase the need for fire and police protection services to such an extent as to cause a reduction in acceptable response time or to outpace natural growth in the region and require construction of new fire and police stations as part of the SBSP Restoration Project. Therefore, potential impacts would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. This alternative would be similar to Alternative Ravenswood B except that Ponds R5 and S5 would be managed ponds designed to simulate tidal mudflats and Pond R3 would be further enhanced for western snowy plovers; also, additional recreation and access components would be added. In addition to the viewing platform at Ponds R5 and S5, described for Alternative Ravenswood B above, a spur trail on an elevated boardwalk and a viewing platform would be constructed along the northwestern corner of Pond R4. The trail would begin at the northeast corner of Bedwell Bayfront Park and extend to the northeast along a boardwalk above the lowered and breached levee. The viewing platform would be constructed at the northern terminus of the trail. A trail along the eastern levees of Ponds R5 and S5 would be constructed and linked to the existing trails located on the outer levees of these ponds to form a loop around these ponds. Impacts would be the same as for Alternative Ravenswood B.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. This alternative would be similar to Alternative Ravenswood C except that there would be more activities encouraging habitat creation, salinity treatment, stormwater detention capacity, and flood control capability. The same public access features list in Alternative Ravenswood C would be added, but the trail at the northwest corner of Pond R4 would be on the improved levee itself instead of on a boardwalk. Impacts would be the same as for Alternative Ravenswood C.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.14-1. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the AMP and other Refuge management documents and practices. The public services analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.14-1 Phase 2 Summary of Impacts – Public Services

	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
IMPACT	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.14-1: Increased demand for fire and police protection services.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS

Notes:
Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.15 Utilities

This section of the Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R) describes the existing utilities within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on utilities. The information presented is based on review of existing utility resources within the area, presented in Section 3.15.1, Physical Setting, and other pertinent state and local regulations, presented in Section 3.15.2, Regulatory Setting. Using this information as context, an analysis of the utility-resources-related environmental impacts of the project is presented for each alternative in Section 3.15.3, Environmental Impacts and Mitigation Measures. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented as part of this project. Therefore, this section only includes additional mitigation measures as needed.

3.15.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Programmatic EIS/R (2007 EIS/R). The baseline condition specific to the Phase 2 pond clusters is based on the current condition of these areas. Background information was drawn from applicable regional and local general plans and policies as well as from utility representatives.

Regional Setting

Gas and electricity are provided by Pacific Gas and Electric Company (PG&E) to all cities in the South Bay except the cities of Palo Alto and Santa Clara. PG&E owns and maintains a network of overhead transmission lines, power distribution lines, and substations. Utilities are provided by the Cities of Palo Alto and Santa Clara to their respective residents primarily through PG&E's network of transmission lines. The Cities of Palo Alto and Santa Clara own and operate small networks of transmission lines, distribution lines, and receiving stations; however, these lines and stations are all landward of the Phase 2 project area.

PG&E overhead power transmission lines traverse the SBSP Restoration Project area. Several PG&E access points for reconductoring of transmission lines are within the Alviso pond complex and one is within the Ravenswood pond complex.

Water and wastewater utilities are provided on both citywide and regional levels. The facilities and infrastructure supporting the services are maintained by the service providers. Water and wastewater infrastructure includes water and wastewater pipelines, wastewater treatment plants and discharge facilities, and storm drainage facilities. Water and wastewater pipelines are generally underneath city streets. However, in some circumstances, wastewater force mains may traverse the SBSP Restoration Project area. In the lower reaches of the watersheds, runoff from developed areas is carried through pipes and discharged to tidal sloughs or channels by gravity-driven flow or lift stations. Stormwater discharged by lift stations is relatively unaffected by slight variations in tide. An extensive inventory of stormwater facilities is provided in previous project reports (Moffatt & Nichol 2005). At present, not all storm outfalls to the restoration area have been located in the field. Data such as pipe invert information and system capacity have not been determined.

Two other utilities are near the SBSP Restoration Project's Phase 2 area. The Hetch Hetchy Aqueduct, which conveys a significant portion of the Bay Area's water supply from the Sierra Nevada, runs from east to west just south of State Route (SR) 84 and the Dumbarton Bridge near the Ravenswood Ponds. The Regional Water Quality Control Plant in Palo Alto is adjacent to and discharges to the far South Bay between the Alviso and Ravenswood pond complexes.

The agencies responsible for and the specific locations of the utility infrastructure within each SBSP Restoration Project Phase 2 pond clusters are discussed below.

Project Setting

This section outlines the existing utilities that are in each of the Phase 2 area pond clusters.

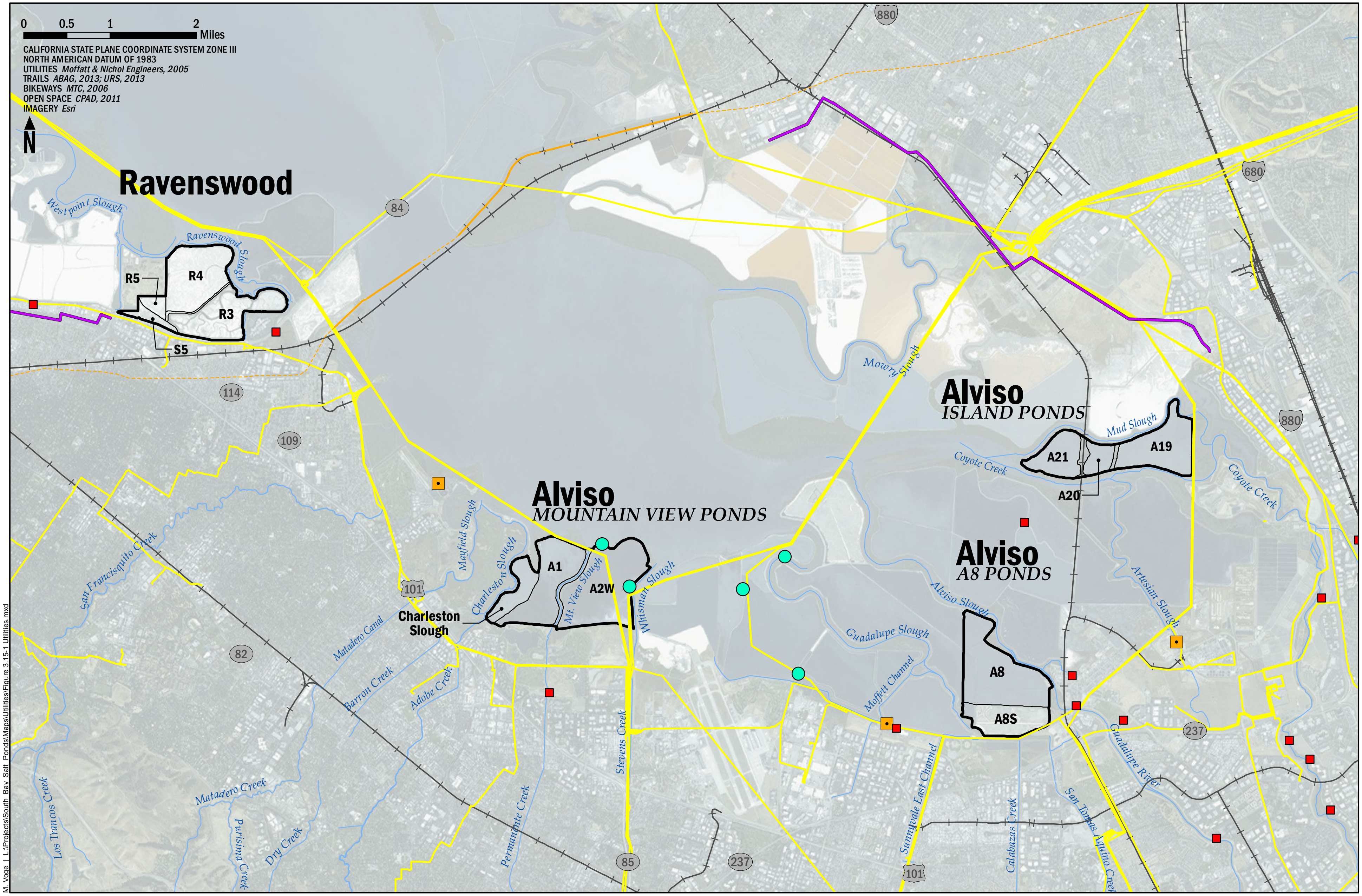
Alviso-Island Ponds

No PG&E overhead transmission lines traverse the Alviso-Island pond cluster; however, an overhead power transmission line (PG&E's Newark-Kifer line) is located along the east boundary of Pond A19, outside of the project boundary. Other power distribution lines in the Island Ponds vicinity, shown on maps in the Utilities section (Section 3.16) of the 2007 EIS/R, have since been removed as part of Phase 1 or other actions. There are no water or wastewater pipelines running through the Alviso-Island pond cluster. Figure 3.15-1 shows the existing infrastructure within the Alviso-Island pond cluster.

Alviso-Mountain View Ponds

Two PG&E overhead transmission lines traverse the Alviso-Mountain View pond cluster. The first line is the Newark-Ames line, which enters Pond A2W over the eastern levee boundary with Whisman Slough, enters less than 200 feet into Pond A2W, travels south parallel with the levee, then leaves Pond A2W at the southern border, continuing into the Stevens Creek Marsh. The second line is the Ravenswood-Ames line, which enters Pond A2W from the southern boundary with Stevens Creek Marsh, travels northwesterly to the northern edge of Pond A2W, makes a turn westward through Pond A2W (a distance of 800 feet), and exits the pond cluster, continuing along the boundary of Pond A1. In total, 16 transmission towers are located within Pond A2W. PG&E has two reconductoring access points on the levees of Pond A2W. There are also six towers just north of Pond A1. PG&E utilizes some of the levees of the Mountain View Ponds for vehicular access to these towers (and into the ponds via boardwalk) for regular maintenance and repair.

No water or wastewater pipelines run through the Alviso-Mountain View pond cluster. Storm drain outfalls from the City of Mountain View and other upstream communities are known to exist on Permanente Creek and Stevens Creek (Moffatt & Nichol 2005). Permanente Creek is part of the Lower Peninsula Watershed and drains an area of approximately 17 square miles. Permanente Creek becomes Mountain View Slough as it nears San Francisco Bay (Bay), in Mountain View. The creek contributes a small amount of freshwater flow to the Bay because much of the stormwater is diverted to Stevens Creek via the Permanente Creek Diversion. Two outfalls deposit into Permanente Creek approximately 300 feet north of Amphitheatre Parkway and another just north of the U.S. Highway 101 (U.S. 101) crossing. In addition to receiving peak flows from Permanente Creek, Stevens Creek drains approximately 29 square miles of the Lower Peninsula Watershed within the City of Mountain View.



- Lift Station
- PG&E Access Location
- Wastewater Outfall
- Hetch Hetchy Aqueduct (above ground)
- Hetch Hetchy Aqueduct (below ground)
- Waste Water Force Main
- Overhead Power Transmission Line
- Phase 2 Project Area

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URS
South Bay Salt Pond Restoration Project

Figure 3.15-1
Utilities

Stevens Creek is between the outboard levees of Ponds A2W on the west and Ponds AB1 and A2E on the east. On some maps, Stevens Creek is shown as depositing flows directly into the Bay; in others, the outermost reaches of the creek are labeled as Whisman Slough. There are six existing stormwater and wastewater outfalls along Stevens Creek: at the east end of L'Avenida, just south of U.S. 101, 150 feet south of U.S. 101 (two outfalls; one enters from the east side of the creek and one from the west side), at the west end of Walker Drive, and at the intersection of East Middlefield Road and Stevens Creek Freeway. Figure 3.15-1 shows the existing infrastructure within the Alviso-Mountain View pond cluster.

Alviso-A8 Ponds

Before the Phase 1 actions at the Alviso-A8 pond cluster, a PG&E overhead transmission line crossed the A8 Ponds. However, this line was removed in conjunction with the Phase 1 actions. No water or wastewater pipelines run through the A8 Ponds; however, the Santa Clara Valley Water District has an outfall into Pond A5, adjacent to Ponds A8 and A8S. The site selection and design of the habitat transition zones in Pond A8S were done in such a way as to avoid interfering with this outfall. Figure 3.15-1 shows the existing infrastructure within the Alviso-A8 pond cluster.

Ravenswood Ponds

PG&E overhead transmission lines do not traverse the Phase 2 Ravenswood pond cluster. However, there are PG&E overhead transmission lines (the Ravenswood-Ames line), a substation, and several smaller power distribution lines in the eastern portions of the Ravenswood pond cluster and immediately adjacent to it, to the south between the ponds and State Route 84 and into Bedwell Bayfront Park to the west.

No water or wastewater facilities are within the Ravenswood pond cluster. However, the Bayfront Canal and Atherton Channel, which are stormwater management outfall systems for local cities and unincorporated areas of San Mateo County, empty into Flood Slough, immediately adjacent to the western tip of Pond S5 and Bedwell Bayfront Park. Figure 3.15-1 shows the existing infrastructure within the Ravenswood pond cluster.

3.15.2 Regulatory Setting

This section provides the regulatory background necessary to analyze the effects on utilities associated with Phase 2 of the SBSP Restoration Project. Applicable local and regional plans and policies are reviewed for information on existing land uses and policies.

Overhead Electrical Transmission Lines

General Order 95 from the California Public Utilities Commission (California Public Utilities Commission 2012) includes rules governing line clearance for overhead electrical transmission lines. It states the following:

> Rule 11. Water areas not suitable for sailboating must have a line clearance of at least 25 ft (8 m) above high water.
>
> Rule 12. Water areas suitable for sailboating, with a surface area over 2,000 acres, must have a line clearance of at least 47 ft (14 m) above high water.

General Order 95 states that Rule 11 can be applied to areas where sailboating is prohibited and where other boating activities are allowed. Once ponds are breached and made tidal, they become part of the Bay, so these rules are relevant to several different ponds that would be so modified in Phase 2.

Alviso Ponds

City of Fremont. The City of Fremont General Plan (City of Fremont 2011) includes the following relevant policy:

> Policy 9-3.1:Water, Flood, and Sanitary Sewer Services
>
> Work with the Alameda County Water District, Union Sanitary District, and Alameda County Flood Control District to encourage their long range plans are consistent with the Fremont General Plan.

City of San Jose. The City of San Jose 2040 General Plan (City of San Jose 2011) includes the following relevant goal:

> Goal IN-1 – General Provision of Infrastructure
>
> Provide and maintain adequate water, wastewater, stormwater, water treatment, solid waste and recycling, and recycled water infrastructure to support the needs of the City's residents and businesses.

County of Santa Clara. The County of Santa Clara General Plan (County of Santa Clara 1994) provides public services-related strategies and policies associated primarily with new (urban) development and as such are not directly related to the proposed project or its impacts on utilities. Strategy #4 of the General Plan identifies the need to improve quality of life for all segments of the population. Policy C-EC 8(g) recognizes the need for providing adequate and efficient public services.

City of Sunnyvale. The City of Sunnyvale General Plan (City of Sunnyvale 2011) includes the following citywide vision goal:

> XII. Supportive Utilities:

To provide and maintain water, sewer, solid waste disposal, and drainage facilities that are safe, efficient, and reliable, and which can develop sufficient capacity to meet the expected growth of the city.

City of Mountain View. The City of Mountain View 2030 General Plan (City of Mountain View 2012) does not provide specific relevant goals or policies associated with public utilities.

Ravenswood Ponds

City of Menlo Park. The City of Menlo Park General Plan Policy Document (City of Menlo Park [1994] 2001) does not provide specific relevant goals or policies associated with utilities and neither does the 2004 Menlo Park Municipal Code.

City of Redwood City. The Redwood City General Plan's Built Environment: Infrastructure Element (City of Redwood City 2010) includes the following citywide vision goals:

> Goal BE-40: Provide safe and reliable potable and recycled water storage and distribution systems that will meet current and future needs.

Goal BE-41: Provide adequate and reliable wastewater collection and treatment facilities that meet current and future needs.

Goal BE-42: Support reliable, high quality, and environmentally sound energy distribution systems to meet current and future demands.

3.15.3 Environmental Impacts and Mitigation Measures

Overview

The SBSP Restoration Project would restore a substantial portion of the approximately 15,100-acre SBSP Restoration Project area to tidal marsh and would therefore contribute to changes in water levels, tidal flows and sedimentation patterns in the South Bay, the tidal sloughs, and the ponds over the 50-year planning horizon. These changes would potentially affect the operation and management of existing utilities (e.g., electrical transmission lines and substations, gas pipelines, storm drains, pump stations, and wastewater treatment plant outfalls) within the SBSP Restoration Project area. Impact evaluations for the Action Alternatives are based on the existing conditions described in Section 3.15.1, Physical Setting, and not the proposed conditions that would occur under the No Action Alternative.[1] This approach mimics what was done for the 2007 EIS/R. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the Adaptive Management Plan (AMP) and other management documents and practices for the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), though those programs would continue as they do now.

Significance Criteria

For the purposes of this Final EIS/R, the project would have a significant impact if it would:

- Substantially reduce the ability to access PG&E towers, stations, or electrical transmission lines;
- Reduce clearance between waterways and electrical transmission lines such that navigation of watercraft or regulatory compliance was affected;
- Reduce the integrity of PG&E's utility infrastructure;
- Change water level, tidal flow, or sedimentation such that drainage of storm drains, operation of pumping facilities, or discharge of sewer force mains were substantially affected; Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption;
- Disrupt rail service due to project activities such as construction or operations and maintenance; or
- Reduce access to sewer force mains due to levee construction.

As explained in Section 3.1.2, Environmental Setting and Impact Analysis, although both Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (CEQ 2015) and the California Environmental Quality Act (CEQA) Guidelines (AEP 2014) were considered during the impact analysis, impacts identified in this Final EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

[1] "No Action Alternative" is the National Environmental Policy Act (NEPA) term. It corresponds to the California Environmental Quality Act (CEQA) term "No Project Alternative." This Final EIS/R uses No Action throughout.

Program-Level Evaluation

The 2007 EIS/R conducted broad, regional analyses of program-level utility impacts from the types of activities that would be necessary to implement Programmatic Alternative A (the No Action Alternative) and Programmatic Alternatives B and C (the two program-level Action Alternatives) and the outcomes of their implementation. The 2007 EIS/R evaluated the potential utility impacts of these three long-term alternatives against nine program-level impacts, most of which were each determined to have less-than-significant impacts to utilities. The exceptions were potentially significant impacts on PG&E tower structural integrity resulting from Programmatic Alternative A (the No Action Alternative) and on rail service due to construction of coastal flood levees and tidal marsh restoration under both Action Alternatives (Programmatic Alternatives B and C).

Project-Level Evaluation

Phase 2 Impact 3.15-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.

Alviso-Island Ponds

Alternative Island A (No Action). Ponds A19, A20, and A21 do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island A (the No Action Alternative) would not impede access to PG&E transmission facilities, and there would be no impact.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Alternative Island B actions would occur within ponds that do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island B would not impede access to PG&E transmission facilities, and there would be no impact.

Alternative Island B Level of Significance: No Impact

Alternative Island C. Alternative Island C actions would occur within ponds that do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island C would not impede access to PG&E transmission facilities. Therefore, Alternative Island C would not reduce access to PG&E transmission facilities, and there would be no impact.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Two PG&E overhead power transmission lines and a total of 16 transmission towers are within Pond A2W, with PG&E access provided via boardwalk from Shoreline Park and from the pond's outboard levee. Another two towers are on the northwestern portion of Pond A2W's outboard levee. Pond A1 and Charleston Slough do not contain any transmission towers; however, six towers are just north of Pond A1, and PG&E utilizes the levee of Pond A1 for vehicular access to these towers (via boardwalk) for regular maintenance and repair. There are another 12 towers connected to the Pond A1 levee via a boardwalk that extends northwesterly into open bay waters until reaching the mouth of Mayfield Slough. Under Alternative Mountain View A (the No Action Alternative), no new activities would be implemented as part of Phase 2. The United States Fish and Wildlife Service (USFWS) is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System, the AMP, and other Refuge management documents and practices. The pond cluster would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices. The levees around Ponds A1 and A2W are high-priority levees, to be maintained for inland flood protection, and would be maintained (or repaired on failure). In addition to levee maintenance, PG&E tower improvements would be made within and around the Mountain View Ponds as part of routine maintenance, to comply with the requirements of the North American Electric Reliability Corporation (NERC) program (a cross-utility agreement to improve the safety and reliability of electrical transmission and distribution systems), and to adapt to sea-level rise. These improvements may involve raising towers and/or raising and strengthening the foundations or superstructures of towers. Because of the continued maintenance of levees and ponds and the improvements planned for towers under the NERC program, impacts to PG&E's ability to access existing towers via levees and boardwalks would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. This section discusses Pond A2W and Pond A1 separately. Pond A2W is described first because it has power lines and access boardwalks directly within it.

Pond A2W. Two PG&E overhead power transmission lines and a total of 16 transmission towers are within Pond A2W, with access provided via boardwalk from both the shore of the City of Mountain View and the northwest corner of the pond's outboard levee. Another two towers are on the northwesterly portion of the outboard levee. Implementation of the Alternative Mountain View B actions would increase water levels and sediment deposition in Pond A2W. To avoid or minimize impacts to PG&E facilities and access to those facilities for maintenance and repair, the project would include raising the concrete foundations of PG&E towers and raising and improving the maintenance boardwalks.

Pond A2W would be breached at two locations on the west side levee and two locations on the east side levee to bring tidal flows into the pond. The specific locations of these breaches would be determined during advanced construction design, but their locations would generally follow the locations of historical slough traces. Bridges would be installed across the breaches on the eastern levee to maintain the connectivity of the existing PG&E access road on this levee. A habitat transition zone would be constructed along the southern shoreline to create a transition habitat between the lower elevation of the pond and the shore to provide habitat for terrestrial species and foraging habitat for a variety of shorebirds. The habitat transition zone would be constructed around and beneath existing PG&E transmission towers and maintenance boardwalks that extend from Shoreline Park and the Pond A2W levees. Alternative Mountain View B would raise the boardwalks to above the high-tide levels that would be introduced into Pond A2W, providing a path of avoidance of any sensitive habitat that would develop on the habitat transition zone. These towers would be maintained by PG&E. Therefore, the restoration of Pond A2W would not be expected to reduce access to the existing transmission lines from the loss of levee connectivity or due to an increase in the abundance of threatened and endangered species, and impacts would be less than significant.

Pond A1. Pond A1 does not contain any transmission towers within the boundary of the pond. However, there are six towers just north of Pond A1's outboard levee. This levee currently provides a connection via boardwalk to 12 more towers on a transmission line that extends northwestward into open Bay waters. The boardwalk ends at a boat dock at the mouth of Mayfield Slough, which provides a second viable means of access to these towers. Alternative Mountain View B proposes a breach on the northwest corner of Pond A1's western levee, outside of the Charleston Slough tide gate. The breach and eventual erosion of the outboard levees would terminate tower access routes that exist along the western levee of Pond A1 and along the levee of Charleston Slough (crossing over the Charleston Slough tide gate). However, as part of the Phase 2 design, PG&E would construct new sections of boardwalk across Mountain View Slough to connect the boardwalk that ends just to the northwest of Pond A1's levees with the existing boardwalk within Pond A2W. In this way, PG&E access would be maintained. Also, access to the transmission towers outside of the Pond A1 levees via boat or helicopter would not be impacted.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Impacts related to PG&E access caused by Alternative Mountain View C would be similar to those discussed in Alternative Mountain View B for Pond A2W and Pond A1. The boardwalk improvements and additions and the bridges over the breaches in Pond A2W would continue to provide PG&E with its required access to the towers and power lines. The additional incorporation of Charleston Slough into the SBSP Restoration Project would not affect PG&E's access to the towers or power lines. However, because Alternative Mountain View C would add a public access trail on the eastern and northern levee of Pond A2W, some additional precautions would need to be taken. To maintain public safety during periods of vehicle use by PG&E crews on that levee trail and access road, USFWS would suspend public access to these trails as needed. Therefore, Alternative Mountain View C would not reduce PG&E access and impacts would be less than significant

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Ponds A8 and A8S do not contain PG&E towers or stations. Therefore, Alternative A8 A (the No Action Alternative) would not impede access to these facilities.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. The Alternative A8 B actions at Ponds A8 and A8S would occur within ponds that do not contain PG&E infrastructure. Therefore, they would not impede access to PG&E facilities.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), no new activities would be implemented as part of Phase 2. Ponds R3, R4, R5, and S5 do not contain PG&E towers or stations. Therefore, Alternative A would not impede access to these facilities.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Ponds R3, R4, R5, and S5 do not contain PG&E towers or stations. Therefore, Alternative Ravenswood B would not impede access to these facilities. Further, Alternative Ravenswood B would not change or impede access to the PG&E infrastructure in the surrounding areas.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. Ponds R3, R4, R5, and S5 do not contain PG&E towers or stations. Therefore, Alternative Ravenswood C would not impede access to these facilities. Further, Alternative Ravenswood C would not change or impede access to the PG&E infrastructure in the surrounding areas.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. Ponds R3, R4, R5, and S5 do not contain PG&E towers or stations. Therefore, Alternative Ravenswood D would not impede access to these facilities. Further, Alternative Ravenswood D would not change or impede access to the PG&E infrastructure in the surrounding areas.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-2: Reduced clearance between waterways and PG&E electrical transmission lines.

Alviso-Island Ponds

Alternative Island A (No Action). Ponds A19, A20, and A21 do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island A (the No Action Alternative) would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative Island A Level of Significance: No Impact

Alternative Island B. The Alternative Island B actions would occur within ponds that do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island B would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative Island B Level of Significance: No Impact

Alternative Island C. The Alternative Island C actions would occur within ponds that do not contain PG&E towers, transmission lines, or stations. Therefore, Alternative Island C would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Two PG&E overhead transmission lines are within and around Pond A2W. Pond A1 and Charleston Slough do not contain transmission lines or towers. Under Alternative Mountain View A (the No Action Alternative), no new activities would be implemented as part of Phase 2. USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System, the AMP, and other Refuge management documents and practices. The Mountain View Ponds would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices. The levees around Ponds A1 and A2W are high-priority levees to be maintained for inland flood protection and would be maintained (or repaired on failure). In addition to levee maintenance, PG&E tower improvements would be made to the lines in and around Pond A2W as part of routine maintenance, to comply with the requirements of the NERC program, and to adapt to sea-level rise. These improvements would involve raising towers and raising and strengthening the foundations or superstructures of towers. All tower improvements and modifications have previously been approved and permitted by the appropriate regulatory agencies. Because of the continued maintenance of levees and ponds and the improvements made to towers under the NERC program, Pond A2W is protected from tidal influence and therefore there is no potential impact as a result of Alternative A reducing clearance between waterways and PG&E electrical transmission lines.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. This section discusses Pond A2W and Pond A1 separately. Pond A2W is described first because it has power lines and access boardwalks directly within it.

Pond A2W. Two PG&E overhead power transmission lines are within Pond A2W. Implementation of the Alternative Mountain View B action would increase water levels and sediment deposition in Pond A2W. Conversion of this pond to tidal marsh habitat would require PG&E to upgrade the tower foundations to account for the introduced tidal flux, a maintenance and improvement activity that would occur as part of Alternative Mountain View B. The concrete pedestals on which the towers sit would be raised to elevate the metal portions of the towers above the highest tides.

The additional boardwalk section and the bridges over the breaches on the eastern side of Pond A2W would form an effective physical barrier to entry into what would otherwise be potentially navigable waterways during certain parts of the tide cycles. USFWS would prohibit boat entry into the ponds themselves, but accidental entry would still be a possibility. New sections of boardwalk connecting from Pond A2W to the existing boardwalk outside of the Palo Alto Flood Basin would also prohibit entry into Mountain View Slough.

However, because of these physical barriers, the towers themselves would not need to be extended to lift the power lines high enough that the “bellies” (the low point of the sag in the lines between two towers) would be compliant with California Public Utilities Commission General Order 95’s (2012) Rule 12 regarding power lines over navigable waters. These regulations require clearance of at least 47 feet above high water. Instead, because of the barriers, the ponds would only need to be compliant with California Public Utilities Commission General Order 95’s (2012) Rule 11, which requires 25 feet of clearance about high water. The existing towers and power lines would have bellies that meet this requirement even under the increased water levels in Pond A2W that would be brought about by breaching.

Once these barriers are in place, there would be no power lines over navigable waterways. Thus, the increase in water levels as a result of Alternative Mountain View B would have a less-than-significant impact on the reduced clearance between waterways and PG&E electrical transmission lines within Pond A2W.

Pond A1. Pond A1 does not contain PG&E transmission lines or towers. Alternative Mountain View B would not reduce clearance between waterways and PG&E electrical transmission lines in Pond A1.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Impacts from Alternative Mountain View C would be similar to those discussed in Alternative Mountain View B for Pond A1 and Pond A2W. The impacts from Charleston Slough would also be less than significant because there are no power lines or towers within it.

Alternative Mountain View C Level of Significance: Less than significant

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no PG&E towers within the A8 pond cluster. Therefore, Alternative A8 A (the No Action Alternative) would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no PG&E towers within the A8 pond cluster. Therefore, Alternative A8 B would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no PG&E towers within the Ravenswood pond cluster. Therefore, Alternative Ravenswood A (the No Action Alternative) would not reduce clearance between waterways and PG&E electrical transmission lines.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no PG&E towers within the Ravenswood pond cluster. Therefore, Alternative Ravenswood B would not reduce clearance between waterways and PG&E electrical transmission lines in the ponds or in the surrounding areas.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. There are no PG&E towers within the Ravenswood pond cluster. Therefore, Alternative Ravenswood C would not reduce clearance between waterways and PG&E electrical transmission lines in the ponds or in the surrounding areas.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. There are no PG&E towers within the Ravenswood pond cluster. Therefore, Alternative Ravenswood D would not reduce clearance between waterways and PG&E electrical transmission lines in the ponds or in the surrounding areas.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-3: Reduced structural integrity of PG&E towers.

Alviso-Island Ponds

Alternative Island A (No Action). There are no functioning PG&E towers within the Island pond cluster. Therefore, there is no potential for impacts related to loss of the towers' structural integrity under Alternative Island A (the No Action Alternative).

Alternative Island A Level of Significance: No Impact

Alternative Island B. There are no functioning PG&E towers within the Island pond cluster. Therefore, there is no potential for impacts related to loss of the towers' structural integrity under Alternative Island B.

Alternative Island B Level of Significance: No Impact

Alternative Island C. There are no functioning PG&E towers within the Island pond cluster. Therefore, there is no potential for impacts related to loss of the towers' structural integrity under Alternative Island C.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). There are 16 transmission towers within Pond A2W, and the pond's outboard levee provides maintenance vehicle access to these structures. Another two towers are on the northwesterly portion of Pond A2W's outboard levee. Pond A1 does not contain any transmission towers with the boundary of the pond. However, six towers are just north of Pond A1. PG&E utilizes the levees around both of these ponds for vehicular access to these towers. PG&E also has boardwalks within Pond A2W for access to the full extent of the power lines. These levees and boardwalks are used for regular maintenance and repair.

Under Alternative Mountain View A (the No Action Alternative), no new activities would be implemented as part of Phase 2. USFWS is maintaining the ponds as part of the Don Edwards San Francisco Bay National Wildlife Refuge System, the AMP, and other Refuge management documents and practices. The Mountain View Ponds would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices. The levees around Ponds A1 and A2W are high-priority levees, to be maintained for inland flood protection, and would be maintained (or repaired on failure).

Continued management of the Pond A1 and Pond A2W levees would not affect the structural integrity of the PG&E towers in or around the Mountain View Ponds. More frequent overtopping of the Pond A2W levees during flood events would temporarily increase water levels. Although water level increases would be short lived, such increases would have the potential to affect the structural integrity of the 16 towers within Pond A2W. In addition to levee maintenance, PG&E tower improvements would be made within Pond A2W as part of routine maintenance, to comply with the requirements of the NERC program, and to adapt to sea-level rise. These improvements may involve raising towers and/or raising and strengthening the foundations or superstructures of the towers.

Because of the continued maintenance of the levees and ponds and the improvements made to towers under the NERC program, impacts to the structural integrity of the PG&E towers would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. This section discusses Pond A2W and Pond A1 separately. Pond A2W is described first because it has power lines and access boardwalks directly within it.

Pond A2W. There are 16 transmission towers within Pond A2W, and the pond's outboard levee provides maintenance vehicle access to these structures. Another two towers are on the northwesterly portion of the outboard levee. Implementation of the Alternative Mountain View B action would increase water levels and sediment deposition in Pond A2W. To avoid or minimize impacts to PG&E facilities, the project would reinforce the existing concrete pedestals on which the 16 transmission towers sit, with additional concrete placed higher up on the tower legs to armor the metal portions of the towers from the corrosive action of salt water from the highest tides. The parts of the Pond A2W levee currently supporting PG&E towers would be maintained.

Pond A1. Pond A1 does not contain any transmission towers. Continued maintenance of the Pond A1 levee would limit any effect of Alternative Mountain View B on the structural integrity of the PG&E towers in the pond.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Impacts from Alternative Mountain View C would be similar to those discussed in Alternative Mountain View B, except that Charleston Slough would be involved. However, Charleston Slough does not contain PG&E towers, and therefore, this alternative would not affect the structural integrity of the towers any differently than Alternative Mountain View B would.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no PG&E towers within the A8 pond cluster. Alternative A8 A (the No Action Alternative) would occur within ponds that do not contain PG&E towers, and therefore Alternative A8 A would not affect the towers' structural integrity.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no PG&E towers within the A8 pond cluster. The Alternative A8 B actions within the A8 Ponds would occur within ponds that do not contain PG&E towers, and therefore, Alternative A8 B would not affect the towers' structural integrity.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no PG&E towers within the Ravenswood pond cluster. Levee failures and unplanned breaches near the PG&E towers within and along the banks of Ravenswood Slough could increase tidal prism at the mouth of Ravenswood Slough, possibly inducing channel widening and potentially undermining the integrity of the towers. However, if levee failure immediately adjacent to a tower were expected, USFWS would coordinate with PG&E to provide localized levee protection to avoid scour around the tower foundation.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. The Alternative Ravenswood B actions within the Ravenswood Ponds would occur within ponds that do not contain PG&E towers, and therefore Alternative Ravenswood B would not affect the towers' structural integrity.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. The Alternative Ravenswood C actions within the Ravenswood Ponds would occur within ponds that do not contain PG&E towers, and therefore Alternative Ravenswood C would not affect the towers' structural integrity.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. The Alternative Ravenswood D actions within the Ravenswood Ponds would occur within ponds that do not contain PG&E towers, and therefore Alternative Ravenswood D would not affect the towers' structural integrity.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-4: Changes in water level, tidal flow and sedimentation near storm drain systems.

Stormwater facilities collect rainfall runoff from upland areas and discharge via gravity flow and/or pumping into the SBSP Restoration Project area. These flows typically discharge to channels and sloughs leading to the Bay. Most drainage channels collect stormwater from at least one outfall that discharges via gravity when water levels in the slough are lower than the outfall (at low tide). The following discussion addresses potential impacts to gravity-driven storm drainage. Potential impacts to storm drain systems that rely on pumping are addressed in Phase 2 Impact 3.15-5, below.

The potential for impacts depends on the change to low-tide elevations, amount of channel sedimentation near the outfall, the capacity of the storm drain system, and the ability of the structure to function properly with higher low-tide elevations of the receiving water. In storm drain systems that do not have the capacity to accommodate higher low-tide elevations or sedimentation near the outfall, reduced conveyance through the structures could potentially result in ponding of stormwater in developed areas.

Alviso-Island Ponds

Alternative Island A (No Action). Two storm drain outfalls are upstream from the Island pond cluster, one from Laguna Creek into Mud Slough and the other from the Fremont Flood Control Chanel in Coyote Creek. Under Alternative Island A (the No Action Alternative), unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation along Mud Slough and Coyote Creek, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches at the Island pond cluster are not expected to affect the ability to operate storm drain systems.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B would continue the transition of the Island Ponds to tidal marsh, which could result in additional sediment deposition into Coyote Creek. However, the restoration actions at the Island Ponds are far away from the storm drain systems in the upstream areas. Although Alternative Island B would modify the tidal flux in the ponds, the modifications would not cause substantial changes in tidal levels, sedimentation, or stormwater management in upstream areas.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would continue the transition of Island Ponds to tidal marsh, which could result in additional sediment deposition into Coyote Creek and Mud Slough. However, the restoration actions at the Island Ponds are far away from the storm drain systems in the upstream areas. Although Alternative Island C would modify the tidal flux in the ponds, the modifications would not cause substantial changes in tidal levels, sedimentation, or stormwater management in upstream areas.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Several outfalls are upstream from the Mountain View pond cluster, on Permanente Creek and Stevens Creek in the city of Mountain View. Under Alternative Mountain View A (the No Action Alternative), unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation along Permanente Creek (drains to Mountain View Slough) and

Stevens Creek, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches at the Mountain View pond cluster are not expected to affect the ability to operate storm drain systems.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Under Alternative Mountain View B, potential impacts to outfalls would be slightly greater in Alternative Mountain View B than under Alternative Mountain View A, due to the restoration of ponds connected to Permanente Creek/Mountain View Slough and Stevens Creek/Whisman Slough. However, restoration actions at the Mountain View Ponds would be designed to minimize impacts to the upstream storm drain systems, and the discharge pipes would be improved or relocated as necessary in coordination with the operating agencies. Although Alternative Mountain View B would modify the tidal flux in the ponds, modifications would not cause substantial changes in tidal levels, sedimentation, or stormwater management in upstream areas.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. The sloughs affected by restoration under Alternative Mountain View C to which there are known outfalls are the same as in Alternative Mountain View B. However, restoration actions at the Mountain View Ponds would be designed to minimize impacts to the upstream storm drain systems, and the discharge pipes would be improved or relocated as necessary in coordination with the operating agencies. Outfalls are located upstream of the planned breaches.

Alternative Mountain View C would also relocate the primary water intake system for Shoreline Park's sailing lake and would raise the levees around Charleston Slough. The utilities associated with the levee improvements around Charleston Slough would be unaffected by Alternative C because the designs include modifications to the access routes and—as needed—to the utilities themselves, including pumps, pump stations, sumps, valve vaults, and so on.

Therefore, although Alternative Mountain View C would modify the tidal flux in the ponds and Charleston Slough, the modifications would not cause substantial changes in tidal levels, sedimentation, or stormwater management in upstream areas.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Several outfalls are upstream from the A8 pond cluster, on the Guadalupe River in the city of San Jose and San Tomas Aquino Creek in the city of Santa Clara. The Santa Clara Valley Water District has a siphon in Pond A8S, near the southwest corner of the pond, that it can use to divert particularly high outflows in Guadalupe Slough into the pond. Under Alternative A8 A (the No Action Alternative), unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation along Alviso Slough/Guadalupe River and Guadalupe Slough/San Tomas Aquino Creek, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches at the A8 pond cluster would not be expected to affect the ability to operate storm drain systems.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, habitat transition zones would be constructed along the southwestern and southeastern corners of Pond A8S, adding some flood protection, buffering against sea-level rise, adding transitional habitat, and protecting the adjacent landfill. The habitat transition zone at the southwest corner would be placed so as to avoid affecting the structure or function of the Santa Clara Valley Water District's siphon. The addition of habitat transition zone would not affect tidal flow and sedimentation along Alviso Slough/Guadalupe River and Guadalupe Slough/San Tomas Aquino Creek. Overall, the expected changes in water levels and sedimentation patterns are not expected to substantially affect the operation of outfalls. Thus, Alternative A8 B would have the same risks and impacts as Alternative A8 A.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Several outfalls are upstream from the Ravenswood pond cluster, on the Bayfront Canal (drains to Flood Slough). Under Alternative Ravenswood A (the No Action Alternative), unplanned levee breaches could temporarily affect water level, tidal flow and sedimentation along Bayfront Canal, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches at the Ravenswood pond cluster are not expected to affect the ability to operate storm drain systems.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Under Alternative Ravenswood B, potential impacts to outfalls would be slightly greater in Alternative Ravenswood B than under Alternative Ravenswood A due to the restoration of ponds draining to Flood Slough and Ravenswood Slough. Also, the restoration actions of Alternative Ravenswood B would be designed to minimize impacts to the upstream storm drain systems, and the discharge pipes would be improved or relocated as necessary in coordination with the operating agencies. Overall, the expected changes in water levels and sedimentation patterns would not be expected to substantially affect the operation of outfalls.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The sloughs affected by restoration under Alternative Ravenswood C to which there are known outfalls are the same as in Alternative Ravenswood B. The restoration actions of Alternative Ravenswood C would be designed to minimize impacts to the upstream storm drain systems, and the discharge pipes would be improved or relocated as necessary in coordination with the operating agencies. Outfalls are upstream of the planned breaches. Overall, the changes in water levels and sedimentation patterns are not expected to substantially affect the operation of outfalls.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The sloughs affected by restoration under Alternative Ravenswood D to which there are known outfalls are the same as in Alternative Ravenswood B. Also, Alternative Ravenswood D proposes a more complex connection between existing storm drainage and Pond S5's small, triangular forebay and then to Ponds S5 and R5, through the use of box culverts and a connection to the City of Redwood City's Bayfront Canal and Atherton Channel Project. Overall, the changes in water levels and sedimentation patterns are not expected to adversely affect the operation of outfalls, and implementation of the City of Redwood City's Bayfront Canal and Atherton Channel Project would provide a beneficial effect by improving gravity-based outflow during high-tide conditions.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.15-5: Changes in water level, tidal flow and sedimentation near pumping facilities.

The urban areas adjacent to the SBSP Restoration Project area contain several stormwater lift stations that would discharge to sloughs upstream of the levee breaches (Moffatt & Nichol 2005). Lift stations are connected to discharge pipes that extend from the lift station to the adjacent slough where the discharge occurs. During storm events, stormwater runoff from the surrounding developed areas flows through storm drain systems toward the Bay. In areas where discharge to the tidal sloughs via gravity flow is not possible, the stormwater is pumped, or "lifted," and discharged into the adjacent sloughs.

Changes to water levels or sedimentation patterns generally do not substantially affect pumping facilities, unless water surface elevations during high tide are substantially raised or sediment accumulation at discharge locations blocks outfall structures.

Alviso-Island Ponds

Alternative Island A (No Action). Two lift stations are upstream from the Island pond cluster, along Coyote Creek within the City of Fremont. Unplanned tidal conversion under Alternative Island A (the No Action Alternative) would potentially alter water levels in sloughs in the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches would potentially increase sedimentation. Although this effect has not been examined in detail, its impacts to pumping facilities would be expected to be minimal. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B would result in the restoration of ponds draining to Coyote Creek and Mud Slough. Two lift stations are upstream of planned levee breaches and lowering. Tidal conversion under Alternative Island B would potentially alter water levels in sloughs of the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of levee breaches and lowering proposed by Alternative Island B would potentially increase sedimentation; however, the changes in sedimentation patterns are not expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The sloughs affected by restoration under Alternative Island C, to which there are known stormwater lift station connections, are the same as in Alternative Island B. All lift stations would be located upstream of the planned levee breaches and lowering. Overall, the changes in water levels and sedimentation patterns are not expected to substantially affect the operation of these pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). A lift station is upstream from the Mountain View pond cluster along Permanente Creek (which drains into Mountain View Slough) within the City of Mountain View. Unplanned tidal conversion under Alternative Mountain View A (the No Action Alternative) would potentially alter water levels in sloughs in the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches would potentially increase sedimentation. Although this effect has not been examined in detail, its impacts to pumping facilities would be expected to be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Alternative Mountain View B would result in the restoration of ponds that would drain to Permanente Creek/Mountain View Slough and Stevens Creek/Whisman Slough. The Permanente Creek lift station is upstream of planned breaches. Tidal conversion under Alternative Mountain View B would potentially alter tidal water levels in sloughs of the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches proposed by Alternative Mountain View B would potentially increase sedimentation; however, changes in sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. The sloughs affected by restoration under Alternative Mountain View C, which includes Charleston Slough, to which there are known stormwater lift station connections, would be the same as in Alternative Mountain View B. All lift stations would be upstream of the planned breaches. Alternative Mountain View C would include Charleston Slough and could potentially affect the water intake for Shoreline Park's sailing lake. However, this water intake and associated pumping facilities and utilities would be relocated as part of the project. Modeling shows that in its new location, the water intake would not experience increased rates of sedimentation or other difficulties associated with the pumping. Overall, the changes in water levels and sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Several lift stations are upstream from the A8 Ponds along the Guadalupe River (which drains into Alviso Slough) within the city of San Jose and the community of Alviso. Unplanned tidal conversion under Alternative A8 A (the No Action Alternative) would potentially alter water levels within the sloughs in the South Bay, although these changes in water level would not be expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of breaches would potentially increase sedimentation. Although this effect has not been examined in detail, its impacts to pumping facilities would be expected to be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Under Alternative A8 B, potential impacts to pumping facilities would be limited because the only restoration action would be the construction of the two habitat transition zone sections. The Alviso-A8 ponds contain no known stormwater lift station connections. Overall, the changes in water levels and sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Several lift stations are upstream from the Ravenswood pond cluster, along the Ravenswood Slough. Unplanned tidal conversion under Alternative Ravenswood A (the No Action Alternative) would potentially alter water levels within the sloughs of the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches would potentially increase sedimentation. Although this effect has not been examined in detail, its impact to pumping facilities would be expected to be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. Alternative Ravenswood B would result in the restoration of ponds draining to Ravenswood Slough. All lift stations are upstream of planned breaches. Tidal conversion under Alternative Ravenswood B would potentially alter tidal water levels in Ravenswood Slough and other sloughs of the South Bay, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches proposed by Alternative Ravenswood B would potentially increase sedimentation; however, changes in sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The sloughs affected by restoration under Alternative Ravenswood C, to which there are known stormwater lift station connections, are the same as in Alternative Ravenswood B. All lift stations are upstream of the planned breaches. Overall, the changes in water levels and sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in tidal water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The sloughs affected by restoration under Alternative Ravenswood D, to which there are known stormwater lift station connections, are the same as in Alternatives Ravenswood B and Ravenswood C. All lift stations are upstream of the planned breaches. Overall, the changes in water levels and sedimentation patterns would not be expected to substantially affect the operation of pumping facilities. Impacts resulting from changes in water level, tidal flow, and sedimentation near pumping facilities would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.15-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.

The San Jose/Santa Clara Waller Pollution Control Plant (WPCP) and the City of Sunnyvale WPCP discharge to sloughs that drain portions of the Alviso pond complex. The San Jose/Santa Clara WPCP discharges to Artesian Slough upstream of the Aliviso-A8 Ponds, and the City of Sunnyvale WPCP discharges to Moffett Channel, which drains to Guadalupe Slough. The City of Palo Alto Regional Water Quality Control Plant outfall is between the Alviso and the Ravenswood pond complexes. All discharges from these facilities occur outside the SBSP Restoration Project Phase 2 pond clusters (Moffatt & Nichol 2005).

Alviso-Island Ponds

Alternative Island A (No Action). There are no sewer force mains or outfalls in close proximity to the Island pond cluster. Therefore, under Alternative Island A (the No Action Alternative), there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Island A Level of Significance: No Impact

Alternative Island B. There are no sewer force mains or outfalls in close proximity to the Island pond cluster. Therefore, under Alternative Island B, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Island B Level of Significance: No Impact

Alternative Island C. There are no sewer force mains or outfalls in close proximity to the Island pond cluster. Therefore, under Alternative Island C, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). There are no sewer force mains or outfalls in close proximity to the Mountain View pond cluster. Therefore, under Alternative Mountain View A (the No Action Alternative), there would be no potential for changes in water level, tidal flow, and sedimentation near sewer force mains or outfalls.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. There are no sewer force mains or outfalls in close proximity to the Mountain View pond cluster. Therefore, under Alternative Mountain View B, there would be no potential for changes in water level, tidal flow, and sedimentation near sewer force mains or outfalls.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. There are no sewer force mains or outfalls in close proximity to the Mountain View pond cluster. Therefore, under Alternative Mountain View C, there would be no potential for t changes in water level, tidal flow, and sedimentation near sewer force mains or outfalls.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no sewer force mains or outfalls in close proximity to the A8 pond cluster. Therefore, under Alternative A8 A (the No Action Alternative), there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no sewer force mains or outfalls in close proximity to the A8 pond cluster. Therefore, under Alternative A8 B, there would be no potential for changes in water level, tidal flow, and sedimentation near sewer force mains or outfalls.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no sewer force mains or outfalls in close proximity to the Ravenswood pond cluster. Therefore, under Alternative Ravenswood A (the No Action Alternative), there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains or outfalls.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no sewer force mains or outfalls in close proximity to the Ravenswood pond cluster. Therefore, under Alternative Ravenswood B, there would be no potential for the Ravenswood Ponds to experience changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. There are no sewer force mains or outfalls in close proximity to the Ravenswood pond cluster. Therefore, under Alternative Ravenswood C, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. There are no sewer force mains or outfalls in close proximity to the Ravenswood pond cluster. Therefore, under Alternative Ravenswood D, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

The following discussion evaluates potential impacts to service disruption of the Hetch Hetchy Aqueduct due to levee construction and habitat restoration at the Phase 2 locations. There are no Phase 2 ponds within the Phase 2 SBSP Restoration Project area in close proximity to the Hetch Hetchy Aqueduct. Therefore, there would be no potential for the Island, Mountain View, A8, or Ravenswood pond clusters to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alviso-Island Ponds

Alternative Island A (No Action). There are no ponds within the Island pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Island A (the No Action Alternative), there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Island A Level of Significance: No Impact

Alternative Island B. There are no ponds within the Island pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Island B, there would be no potential f to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Island B Level of Significance: No Impact

Alternative Island C. There are no ponds within the Island pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Island C, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). There are no ponds within the Mountain View pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Mountain View A (the No Action Alternative), there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. There are no ponds within the Mountain View pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Mountain View B, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. There are no ponds within the Mountain View pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Mountain View C, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no ponds within the A8 pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative A8 A (the No Action Alternative), there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no ponds within the A8 pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative A8 B, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no ponds within the Ravenswood pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Ravenswood A (the No Action Alternative), there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no ponds within the Ravenswood pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Ravenswood B, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. There are no ponds within the Ravenswood pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Ravenswood C, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. There are no ponds within the Ravenswood pond cluster in close proximity to the Hetch Hetchy Aqueduct. Therefore, under Alternative Ravenswood D, there would be no potential to disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.

Alviso-Island Ponds

Alternative Island A (No Action). A Union Pacific Railroad (UPRR) line currently exists on the levee between Ponds A20 and A21. Under Alternative Island A (the No Action Alternative), the levee containing the active UPRR line would be maintained by UPRR to allow the continued use of the tracks. Under Alternative A, this transition to tidal marsh would be allowed to continue. Aside from the monitoring and management activities of the AMP and maintenance of the railroad track, no other operation and maintenance activities would occur.

Alternative Island A Level of Significance: No Impact

Alternative Island B. The Alternative Island B actions at Ponds A19, A20, and A21 propose no modification to the levee between Ponds A20 and A21. The levee containing the active UPRR track would be maintained by UPRR to allow the continued use of the tracks. Under Alternative Island B, the levee between Ponds A19 and A20 would be removed or lowered to support hydrological connectivity and potentially improve the ecological function of both ponds. Aside from the monitoring and management activities of the AMP and maintenance of the railroad track, no other operation and maintenance activities would occur on the levee between Ponds A19 and A20. The levee containing the existing railroad track would be maintained to allow the continued use of the tracks.

Alternative Island B Level of Significance: No Impact

Alternative Island C. The Alternative Island C actions at Ponds A19, A20, and A21 propose no modification to the levee between Ponds A20 and A21. The levee containing the active UPRR track would be maintained by UPRR to allow the continued use of the tracks. Under Alternative Island C, in addition to Alternative Island B activities, the following actions would be taken: levee breaches on the north sides of Ponds A20 and A21, pilot channels in Pond A19, and widening of the existing breaches on the southern levee of Pond A19. These additional components would be intended to accelerate the conversion of this Island Ponds into tidal marsh. Hydrological connectivity would be created to alter circulation and sedimentation patterns in the Island Ponds and improve the rate of sediment accretion in Pond A19 and, to a lesser extent, in Ponds A20 and A21. Aside from the monitoring and management activities of the AMP and the maintenance of the railroad track, no other operation and maintenance activities would occur on the levee between Ponds A19 and A20. The levee containing the existing railroad track would be maintained to allow the continued use of the tracks.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). There are no rail lines within the Mountain View pond cluster. Under Alternative Mountain View A (the No Action Alternative), there would be no impact on existing rail services.

Mountain View A Level of Significance: No Impact

Alternative Mountain View B. There are no rail lines within the Mountain View pond cluster. Under Alternative Mountain View B, there would be no impact on existing rail services.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. There are no rail lines within the Mountain View pond cluster. Under Alternative Mountain View C, there would be no impact on existing rail services.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no rail lines within the A8 pond cluster. Under Alternative A8 A (the No Action Alternative), there would be no impact on existing rail services.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no rail lines within the Alviso A8 pond cluster. Under Alternative A8 B, there would be no impact on existing rail services.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no rail lines within the Ravenswood pond cluster. Under Alternative Ravenswood A (the No Action Alternative), there would be no impact on existing rail services.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no rail lines within the Ravenswood pond cluster. Under Alternative Ravenswood B, there would be no impact on existing rail services.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. There are no rail lines within the Ravenswood pond cluster. Under Alternative Ravenswood C, there would be no impact on existing rail services.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. There are no rail lines within the Ravenswood pond cluster. Under Alternative Ravenswood D, there would be no impact on existing rail services.

Alternative Ravenswood D Level of Significance: No Impact

Phase 2 Impact 3.15-9: Reduced access to sewer force mains due to levee construction.

There are four separate districts that have jurisdictional lands within the vicinity of the South Bay Salt Ponds Phase 2 project area: the South Bayside System Authority (Silicon Valley Clean Water), the City of Palo Alto, the City of Sunnyvale, and the City of San Jose. However, the 2007 EIS/R showed no buried sewer force mains within the Phase 2 project area (Figure 3.16-1 of that document).

Alviso-Island Ponds

Alternative Island A (No Action). There are no buried sewer force mains within the Island pond cluster. Therefore, under Alternative Island A (the No Action Alternative), there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Island A Level of Significance: No Impact

Alternative Island B. There are no buried sewer force mains within the Island pond cluster. Therefore, under Alternative Island B, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Island B Level of Significance: No Impact

Alternative Island C. There are no buried sewer force mains within the Island pond cluster. Therefore, under Alternative Island C, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Island C Level of Significance: No Impact

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). There are no buried sewer force mains within the Mountain View pond cluster. Therefore, under Alternative Mountain View A (the No Action Alternative), there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. There are no buried sewer force mains within the Mountain View pond cluster. Therefore, under Alternative Mountain View B, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Mountain View B Level of Significance: No Impact

Alternative Mountain View C. There are no buried sewer force mains within the Mountain View pond cluster. Therefore, under Alternative Mountain View C, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Mountain View C Level of Significance: No Impact

Alviso-A8 Ponds

Alternative A8 A (No Action). There are no buried sewer force mains within the A8 pond cluster. Therefore, under Alternative A8 A (the No Action Alternative), there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. There are no buried sewer force mains within the A8 pond cluster. Therefore, under Alternative A8 B, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative A8 B Level of Significance: No Impact

Ravenswood Ponds

Alternative Ravenswood A (No Action). There are no buried sewer force mains within the Ravenswood pond cluster. Therefore, under Alternative Ravenswood A (the No Action Alternative), there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. There are no buried sewer force mains within the Ravenswood pond cluster. Therefore, under Alternative Ravenswood B, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Ravenswood B Level of Significance: No Impact

Alternative Ravenswood C. There are no buried sewer force mains within the Ravenswood pond cluster. Therefore, under Alternative Ravenswood C, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Ravenswood C Level of Significance: No Impact

Alternative Ravenswood D. There are no buried sewer force mains within the Ravenswood pond cluster. Therefore, under Alternative Ravenswood D, there would be no potential for reduced access to sewer force mains due to levee construction.

Alternative Ravenswood D Level of Significance: No Impact

Impact Summary

The Phase 2 impacts to utilities and the levels of significance are summarized in Table 3.15-1. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the AMP and other Refuge management documents and practices. The utilities analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.15-1 Phase 2 Summary of Impacts – Utilities

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.15-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-2: Reduced clearance between waterways and PG&E electrical transmission lines.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-3: Reduced structural integrity of PG&E towers.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	LTS	LTS	LTS
Phase 2 Impact 3.15-4: Changes in water level, tidal flow and sedimentation near storm drain systems.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-5: Changes in water level, tidal flow and sedimentation near pumping facilities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-9: Reduced access to sewer force mains due to levee construction.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Notes:
Alternative A at each pond cluster is the No Action Alternative (the No Project Alternative under CEQA).
LTS = Less than Significant
NI = No Impact

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3.16 Visual Resources

This section of the Final Environmental Impact Statement/Report (referred to throughout as the "Final EIS/R") characterizes the existing visual resources within the Phase 2 project area and whether implementation of the project would cause a substantial adverse effect on visual resources from project implementation. The information presented is based on review of existing visual resources within the area and pertinent state and local regulations, as presented in the section covering the regulatory framework setting. Using this information as context, an analysis of the project's potential impacts on the visual resources is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only includes additional mitigation measures, as needed, for the Phase 2 project.

3.16.1 Physical Setting

Methodology

The development of the baseline visual conditions, significance criteria, and impact analysis for Phase 2 is informed by the Programmatic- and Phase 1-level analysis presented in the 2007 SBSP Restoration Project EIS/R (2007 EIS/R). The assessment of existing visual conditions is also based on a site reconnaissance to gather baseline information on the existing visual character and quality within the area of the Phase 2 pond clusters.[1] Due to the remote location of the Alviso-Island pond cluster, no Phase 2 site reconnaissance was performed at those ponds. Instead, a desktop analysis of existing visual conditions at Ponds A19, A20, and A21 was conducted using URS' photography from recent field work for wetland delineations, publicly available images on Google Maps, and images from the SBSP Restoration Project's library of aerial kite photographs and conventional photography.

This section presents a qualitative assessment of the potential impacts to views and visual character/visual quality associated with each of the alternatives evaluated for Phase 2. The analysis is based on an investigation of existing conditions within the Phase 2 study area, and the potential impact each alternative might have on these conditions. This analysis is commensurate with the level of detail and findings produced for Phase 1. Accordingly, no visual simulations were produced as part of this Phase 2 analysis.

Regional Setting

The San Francisco Bay Area region is in the Coast Ranges Physiographic Province, which spans 400 miles in California from Humboldt County to Santa Barbara County. The San Francisco Bay region is characterized as having a Mediterranean climate, with Coast Redwood forest and chaparral and woodlands. The San Francisco Bay Area is highly developed; however, open space, including areas bordering San Francisco Bay, contributes to the visual character of the region.

As presented in the 2007 EIS/R, the dominant long-range visual resources in the region surrounding the Phase 2 pond clusters include the San Francisco Bay (Bay), the East Bay hills, the Santa Cruz Mountains (to the southwest), open salt ponds along the Bay, the San Mateo Bridge (State Route [SR] 92), and the Dumbarton Bridge (SR 84). The visual setting of the Phase 2 pond clusters ranges from urban—where

[1] URS visual resource analysts conducted a site visit at the Alviso and Ravenswood pond complexes on September 12, 2013.

views include industrial development, roads, and businesses—to open space—where views include parks, baylands, and salt ponds.

The salt ponds along the Bay provide a visual contrast to the dense surrounding urban development of the San Francisco Bay Area due to their geometric and flat dimensional shape (created by raised levees) and their colors (e.g., pink, green, yellow, rust, white).[2] From certain locations, surrounding ground-level streets, trails, and highways provide views of the pond system. The ponds also dominate the views of airline passengers in the approach patterns to the San Francisco, Oakland, and San Jose airports. Viewers from these and other elevated vantage points are able to view the entire salt pond landscape, and the constant changes in the visual character of the ponds are especially notable: colors vary according to the time of day, season, cloud cover, and salinity levels. Viewers standing near the shore of the ponds experience them as a buffer in the visual transition from land to the Bay and beyond on the far shore, adding complexity to the visual environment as the eye is drawn across the Bay to the natural and man-made features beyond (2007 EIS/R).

Project Setting

Alviso Pond Complex

Phase 2 proposes project-related activities within specific pond clusters that are part of the greater Alviso pond complex. The Phase 2 pond cluster areas within the Alviso pond complex include the Alviso-Island pond cluster (Ponds A19, A20, and A21), the Alviso-Mountain View pond cluster (Ponds A1 and A2W and the adjacent Charleston Slough), and the Alviso-A8 pond cluster (Ponds A8 and A8S). The following sections generally describe the existing visual character of views of and from these pond clusters.

Alviso-Island Ponds

Accessibility to the Island Ponds is extremely limited. The area around this cluster does not provide recreational opportunities, and this cluster is not adjacent to commercial, industrial, or residential development. No streets or roads run along or near this pond cluster. Long-range views include the East Bay hills and the Peninsula (Figure 3.16-1). Nearer views include other current and former salt ponds, the Union Pacific Railroad (UPRR) rail corridor and occasional passing passenger and freight trains, and several Pacific Gas and Electric Company (PG&E) towers and power lines. Due to its remote location, the Island Ponds are visible only to viewers at elevated locations or traveling by air or train. Aerial photography of this pond cluster depicts the existing deep green/blue colors of the ponds, with the curved lines of channels running through, bordered by strips of soft golden browns and green strips of vegetated marsh.

Alviso-Mountain View Ponds

The Mountain View Ponds include Pond A1, Pond A2W, and the City of Mountain View's Charleston Slough. The slough is being included in Phase 2 planning and designs through a cooperative agreement between the SBSP Restoration Project's management team and lead agencies and the City of Mountain View, as explained in more detail in Chapter 1, Introduction, and Chapter 2, Alternatives. The Mountain View Ponds are directly adjacent to the north edge of the City of Mountain View's Shoreline Park. Recreational trails exit from the northern corners of the park and join the Bay Trail, which runs along the approximately 2-mile south edge of the cluster. The Bay Trail is highly trafficked by walkers, joggers,

[2] The colors of the ponds are influenced by the presence of algae, minerals, microorganisms, and brine shrimp.

bikers, and birders, who are exposed to sweeping near- and long-range views of the pond cluster. Also, this cluster is near the Palo Alto Airport, and highly visible to low-flying private/recreational air traffic.

Figure 3.16-1. View of Pond A19, facing east

Ponds A1 and A2W. Ponds A1 and A2W are expansive bodies of water, bounded by offshore levees and dotted by a few small islands, which provide landing habitat for various bird species. Long-range views from these ponds include the East Bay hills, PG&E transmission lines, and levees. Near-shore views from these ponds include a long vegetated bank that extends the length of the ponds and the hilly, vegetated buffer between Mountain View's Shoreline Park and the Shoreline Golf Links and the ponds. Tall PG&E transmission lines travel through Pond A2W and northwest along the northern border of Pond A1. These towers dominate views of the east shore of Pond A2W, but become less prevalent as the transmission line moves offshore. The Bay Trail and other walking trails exiting the park converge at a vantage point at the southwestern tip of Pond A1. From this location, Charleston Slough (separated by a small, berm-like levee from Pond A1), portions of Shoreline Lake, and office buildings along Terminal Boulevard are visible.

Charleston Slough. Charleston Slough is a well-known bird-watching location (Figure 3.16-2). Depending on the tide, the slough may be wet or dry. During low tides, Charleston Slough is a mudflat spotted with small, low-lying ponds of water, which may be light brown, purple, deep blue, or black. The colors and textures contrast with the blue bay water of surrounding ponds. Numerous diving and dabbling bird species congregate at various tides, adding a sense of movement that is visible from the trails that surround the slough. The main channel of Charleston Slough snakes through the mudflats, threading sinuous lines that contrast with the comparatively straight levees that form the current salt pond boundaries. During high tides, views of the slough are comparable to Ponds A1 and A2W. A small viewing area with benches is at the southern edge of Charleston Slough, near the levee that separates the slough from Pond A1.

Alviso-A8 Ponds

The A8 Ponds share similar visual characteristics to the Mountain View Ponds. However, the A8 Ponds are in a remote location at the northern end of the Alviso neighborhood in San Jose. Recreational opportunities adjacent to this cluster are limited. Viewer groups include air travelers, viewers in the buildings of the adjacent business park, and workers accessing an adjacent landfill.

Ponds A8 and A8S. Although the Bay Trail spine alignment runs parallel to the southern border of Pond A8S, views of Ponds A8 and A8S are not available from the Bay Trail due to tall stands of marsh vegetation, San Tomas Aquino Creek, and the closed landfill that separate them. Views of this pond cluster are mostly limited to vehicles accessing the small business park atop that closed landfill near the southeastern border of Pond A8S. Recreational access is limited to licensed and permitted waterfowl hunters on certain days during hunting season. However, the rare viewers at this remote cluster will notice the deep blue bay water, urban development, and the Santa Cruz Mountains in the distance.

Figure 3.16-2. View of Charleston Slough at low tide, facing northeast from the Bay Trail.

The portions of the levee that separated Ponds A8 and A8S until it was breached as part of Phase 1 actions provide an interesting visual feature, because the water that runs between the ponds creates an island effect around the pieces of levee that remain intact above water (Figure 3.16-3). This levee is expected to continue to degrade over time and not form a permanent piece of the visual landscape.

Ravenswood Pond Complex

Phase 2 proposes project-related activities within a specific pond cluster (the Phase 2 Ravenswood Ponds) that is part of the greater Ravenswood pond complex. The following sections describe the general character of views of and from the ponds in the western end of the Ravenswood pond complex.

Ravenswood Ponds

Ponds R5 and S5. These ponds are bounded by SR 84; the City of Menlo Park's Bedwell Bayfront Park (built atop a closed landfill); and small, berm-like levees, one of which separates these two ponds on the diagonal. These ponds collect rainfall during the rainy season and become partially inundated, though water levels may vary, creating islands of elevated flat lands or completely covering the surface. During the dry season, the bare, flat surface of the pond bottom and expansive white salt deposits are exposed and intermixed by the snaking lines of the former slough trace channels. There is a small triangular forebay at the western edge of Pond S5 that is separated from the main part of the pond by a short levee. The southwestern edge of Pond S5 borders a small duck pond at the southern tip of Bedwell Bayfront Park. A historic red pumphouse (Figure 3.16-4) sits nearby, creating a visual landmark to viewers walking along the edge of Ponds R5 and S5. The pumphouse is now used by Cargill as a telemetry station for monitoring its remaining ponds. Marsh vegetation lines the outer edge of the duck pond, which provides nesting and foraging habitat for waterbirds visible to viewers from Ponds R5 and S5. The northwestern edges of Ponds R5 and S5 border the hilly Bedwell Bayfront Park, which rises on an incline away from the ponds, adding complexity to the visual environment.

Pond R4. Pond R4 encompasses more than 300 acres of former salt pond (Figure 3.16-5). Elevated portions of the Bedwell Bayfront Park provide expansive views of Pond R4 in the midground and the East Bay hills in the background. Pond R4 is one of the largest salt ponds in the SBSP Phase 2 project area. During the dry season, the dry panne of Pond R4 is similar in color to Ponds R5 and S5, with a deep, usually filled historic slough trace snaking through its interior from east to west, through the otherwise dry pond bottom. The northwestern edge of Pond R4 abuts Greco Island, a fully restored tidal marsh. The deep green textured surface of Greco Island provides visual contrast to the flat and geometrically curved surface of Pond R4.

Pond R3. Visually, Pond R3 is similar to Ponds R4, R5, and S5. It is seasonally influenced like the other ponds and presents the same dry and wet visual conditions. Pond R3 is large and visually expansive like Pond R4, but distantly enclosed like Ponds R5 and S5, as it is sandwiched between SR 84 and the All-American Canal (AAC). Depending on the season, Pond R3 may also support some vegetation.

Figure 3.16-3. View of partially removed levee between Ponds A8 and A8S, facing northwest.

Figure 3.16-4. View of pumphouse, facing northwest from Bedwell Bayfront Park.

Figure 3.16-5. View of Pond R4 from Bedwell Bayfront Park, facing southeast from the Bedwell Bayfront Park pedestrian path.

3.16.2 Regulatory Setting

This section describes the regulatory goals of the jurisdictions surrounding the Phase 2 project area with regard to visual resources in the salt pond area. These goals are defined in city and county general plans and regional planning documents.

Alviso Pond Complex

Alameda County

The Alameda County General Plan designates salt ponds as open space, and among its objectives is providing "a continuous system of open space for the preservation, enhancement, and protection of natural scenic features and preservation and protection of watershed and wildlife areas and agricultural areas" (County of Alameda 1973).

City of Fremont

The City of Fremont General Plan considers its open space frame (which includes wetlands and the Bay) an important visual characteristic (City of Fremont 2011). The open space frame provides for panoramic views of open space from the city and views of the city from the open space frame. The objective and policy relevant to the proposed SBSP Restoration Project to protect visual resources are as follows:

"Policy 4-1.1: Elements of City form. Recognize the basic elements of city form—community plan areas, neighborhoods, centers, corridors, employment districts, and open spaces—as the features that contribute to and define Fremont's sense of place. Ensure that land use and transportation decisions, including design review, zoning, capital improvements, and development approvals, improve the visual qualities of these features and strengthen their identity as distinct places."

Santa Clara County

The County of Santa Clara General Plan identifies strategies and policies to preserve and enhance scenic resources within its boundaries (County of Santa Clara 1994). Three general strategies are (1) Manage Growth and Plan for Open Space; (2) Minimize Development Impacts on Significant Scenic Resources; and (3) Maintain and Enhance the Values of Scenic Urban Settings. Specific policies relevant to the proposed SBSP Restoration Project that support these strategies are identified below.

C-RC 57: The scenic and aesthetic qualities of both the natural and built environments should be preserved and enhanced for their importance to the overall quality of life for Santa Clara County.

C-RC 58: The general approach to scenic resource preservation on a countywide basis should include the following strategies:

a. conserving scenic natural resources through long range, inter-jurisdictional growth management and open space planning;
b. minimize development impacts on highly significant scenic resources; and
c. maintaining and enhancing scenic urban settings, such as parks and open space, civic places, and major public commons areas.

C-RC 59: Scenic values of the natural resources of Santa Clara County should be maintained and enhanced through countywide growth management and open space planning.

City of San Jose

The City of San Jose 2040 General Plan identifies the city's baylands as one of its many scenic resources (City of San Jose 2011). Visual-quality-related goals are generally relevant to new development. The city also recognizes the preservation of scenic routes as critical to the preservation and enhancement of such resources. Designated trails and pathways are near the southern boundary of the Alviso pond complex. The following goal and policy are relevant to the proposed SBSP Restoration Project:

Goal ER-3: Bay and Baylands. Preserve and restore natural characteristics of the Bay and adjacent lands, and recognize the role of the Bay's vegetation and waters in maintaining a healthy regional ecosystems.

ER-3.1-1: Protect, preserve and restore the baylands ecosystem in a manner consistent with the fragile environmental characteristics of this area and the interest of the citizens of San Jose in a healthful environment.

City of Mountain View

The City of Mountain View 2012 General Plan identifies the shoreline as an important resource due to its scenic value in providing visual relief from development (City of Mountain View 2012). The following goals and policies regarding visual quality are applicable to the proposed SBSP Restoration Project.

POS 3.1: Preservation of natural areas. Preserve natural areas, creeks, and shoreline at Mountain View Regional Park primarily for low-intensity uses.

LUD 9.5: View preservation: Preserve significant views throughout the community.

Ravenswood Pond Complex

San Mateo County

The San Mateo County General Plan was written in 1984 and does not contain up-to-date information on the visual quality of the baylands (County of San Mateo 1986). However, the Conservation and Open Space Element develops general policies to protect and enhance scenic resources and establish aesthetic controls over utility structures to protect shorelines (County of San Mateo 1973).

City of Menlo Park

The City of Menlo Park General Plan establishes protection for lands that have “inherent qualities to provide visual amenity, including topographic features, views or vistas… scenic water areas, creeks and the San Francisco Bay” (City of Menlo Park 2013). The following policies are established to enhance visual quality as it relates to the areas of the Phase 2 project activities:

OSC1.6: South Bay Salt Pond Restoration Project and Flood Management Project. Continue to support and participate in Federal and State efforts related to the South Bay Salt Pond Restoration project and flood management project. Provide public access to the bay for scenic enjoyment and recreation opportunities as well as conservation education opportunities related to the open Bay, the sloughs, and the marshes.

The plan establishes the “provision of open space [as] intended to offer residents and visitors opportunities for quiet introspection in a location that provides visual relief from buildings, concrete, and noise associated with more urban life” (City of Menlo Park 2013).

Other Relevant Plans in the Region

San Francisco Bay Plan

The Appearance, Design, and Scenic Views section of the San Francisco Bay Plan (Bay Plan) provides the findings and policies related to the visual effects of development on the shoreline (BCDC 1979). Specific policies relevant to the SBSP Restoration Project include the following numbered items (irrelevant items not included in this list):

3. In some areas, a small amount of fill may be allowed if the fill is necessary—and is the minimum absolutely required—to develop the project in accordance with the Commission’s design recommendations.

4. Structures and facilities that do not take advantage of or visually complement the Bay should be located and designed so as not to impact visually on the Bay and shoreline. In particular, parking areas should be located away from the shoreline. However, some small parking areas for fishing access and Bay viewing may be allowed in exposed locations.

8. Shoreline developments should be built in clusters, leaving open area around them to permit more frequent views of the Bay. Developments along the shores of tributary waterways should be Bay-related and should be designed to preserve and enhance views along the waterway, so as to provide maximum visual contact with the Bay.

9. "Unnatural" debris should be removed from sloughs, marshes, and mudflats that are retained as part of the ecological system. Sloughs, marshes, and mudflats should be restored to their former natural state if they have been despoiled by human activities.

10. Towers, bridges, or other structures near or over the Bay should be designed as landmarks that suggest the location of the waterfront when it is not visible, especially in flat areas. But such landmarks should be low enough to assure the continued visual dominance of the hills around the Bay.

12. In order to achieve a high level of design quality, the Commission's Design Review Board, composed of design and planning professionals, should review, evaluate, and advise the Commission on the proposed design of developments that affect the appearance of the Bay in accordance with the Bay Plan findings and policies on Public Access; Appearance, Design, and Scenic Views; and the Public Access Design Guidelines. City, county, regional, state, and federal agencies should be guided in their evaluation of bayfront projects by the above guidelines.

14. Views of the Bay from vista points and from roads should be maintained by appropriate arrangements and heights of all developments and landscaping between the view areas and the water. In this regard, particular attention should be given to all waterfront locations, areas below vista points, and areas along roads that provide good views of the Bay for travelers, particularly areas below roads coming over ridges and providing a "first view" of the Bay (shown in Bay Plan Map No. 8, Natural Resources of the Bay).

15. Vista points should be provided in the general locations indicated in the [Bay Plan] maps. Access to vista points should be provided by walkways, trails, or other appropriate means to connect to the nearest public thoroughfare where parking or public transportation is available. In some cases, exhibits, museums, or markers would be desirable at vista points to explain the value or importance of the areas being viewed.

The proposed Phase 2 project components would be consistent with the Bay Plan.

3.16.3 Environmental Impacts and Mitigation Measures

Significance Criteria

The significance criteria for visual resources are drawn from those adopted for the 2007 EIS/R. The 2007 EIS/R defined the project as having a significant impact on visual resources if it would:

- Have a substantial, demonstrable negative aesthetic effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

The Phase 2 project area does not contain any designated scenic vistas and is not within the viewshed of a state scenic highway. Furthermore, the Phase 2 project does not include lighting or contain materials that would generate substantial light or glare. Therefore, the Phase 2 project was not evaluated against these significance criteria, and this Final EIS/R does not evaluate the impacts associated with them. The two other significance criteria listed above are included in Impact 3.16-1, which addresses altering the view and visual character of the Phase 2 project ponds.

Although both the Council for Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) Guidelines (AEP 2014) were considered during the impact analysis, the impacts identified in this Final EIS/R are characterized using CEQA terminology.

Program-Level Evaluation

The 2007 Programmatic EIS/R evaluated the potential visual impact of three long-term, program-level alternatives, each of which were determined to have less-than-significant impacts to visual resources, scenic resources, and scenic character. The 2007 Programmatic EIS/R found that under each programmatic alternative, the historic salt production remnants (e.g., piers, Archimedes' screws) would continue to remain in place, therefore limiting changes to visual character in terms of structural development. Furthermore, the 2007 Programmatic EIS/R found that none of the programmatic alternatives would include lighting components or materials that would generate substantial light and glare.

Project-Level Evaluation

Phase 2 Impact 3.16-1: Alter views of the SBSP Restoration Project area.

Alviso-Island Ponds

Alternative Island A (No Action[3]). Under Alternative Island A (the No Action Alternative), Ponds A19, A20, and A21 would continue to be managed through the activities described in the Adaptive Management Plan (AMP) and other management documents and practices for the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). Aside from monitoring and management activities in the AMP other Refuge management documents and practices, Ponds A19, A 20, and A21 were breached on their southern sides in March 2006 as part of the Initial Stewardship Plan (ISP). As such, alteration of existing views of Ponds A19, A20, and A21 would occur in relation to the gradual natural degradation of the levees and the transition of the pond from salt production toward tidal marsh. The gradual change in

[3] "No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This Final EIS/R uses No Action throughout.

visual character associated with the evolution of the salt ponds into tidal marsh would alter existing views; however, this change in habitat would appear as an extension of pre-existing tidal marsh habitat that surrounds the Bay. As such, the transition of salt ponds over time (according to Alternative A) to tidal marsh would not significantly degrade views or the visual character of the SBSP Restoration Project area within the Island Ponds. Under Alternative Island A, there would be a less-than-significant impact on views and the visual character of the SBSP Restoration Project area.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. Alternative Island B would result in an increase of hydraulic connectivity and tidal flushing for Ponds A19 and A20 (but not Pond A21), and all ponds would continue to transition into tidal marshes. The connectivity and habitat complexity would be greater in Alternative B than in Alternative Island A. The transition to tidal marsh would introduce more vegetation than is currently present, altering the texture and color of these ponds and adding contrast between open water and nearby land/salt pond areas. Under Alternative Island B, the views and visual character of the Island Ponds would be gradually altered, as was the intent of the previous breaches; however, this impact would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Alternative Island C would result in an increase of hydraulic connectivity and tidal flushing for Ponds A19, A20, and A21, and all of these ponds would continue to transition into tidal marshes. The connectivity and habitat complexity would be greater in Alternative C than in Alternative Island B. The transition to tidal marsh would introduce more vegetation than is currently present, altering the texture and color of these ponds and adding contrast between open water and nearby land/salt pond areas. Under Alternative Island C, the views and visual character of the Island Ponds would be gradually altered, as was the intent of the previous breaches; however, this impact would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A (the No Action Alternative), Ponds A1 and A2W would remain partially managed ponds, and the fringing marsh outside of the ponds' levees and along Permanente Creek and Mountain View Slough would continue to exist in their current state. As such, the No Action Alternative would not alter the views and visual character of the Mountain View Ponds.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Ponds A1 and A2W would be breached and opened to tidal action under Alternative Mountain View B, beginning their transition into tidal marshes. The creation of tidal habitat would change the visual environment from ponds to vegetated marshes, altering the texture and color of the views. These changes would be visible from recreational trails and elevated locations in nearby Shoreline Park. Bird use at these ponds would be expected to change with the conversion to tidal habitat and the construction of islands within the ponds, increasing the sense of movement as viewed from recreational trails. These changes would create potential effects on the views and visual character of the SBSP Restoration Project area when compared with the deepwater of the ponds to the east. However, these changes would be compatible with views of Charleston Slough and the Palo Alto Flood Basin, which furnish similar vegetation and wildlife. Alternative B would slightly alter the views and visual character of the Mountain View Ponds but would not introduce a high degree of contrast. Therefore, the impacts resulting from Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than significant

Alternative Mountain View C. Ponds A1 and A2W and Charleston Slough would be breached and opened to tidal action, beginning their transition into tidal marshes. The changes in Ponds A1 and A2W would be similar to those described in Alternative Mountain View B. The proposed changes would alter the views and visual environment at Charleston Slough. Opening Charleston Slough to tidal action would convert Charleston Slough and Pond A1 to one continuous tidal marsh, altering the broken-up views of these ponds. The conversion of Charleston Slough to tidal marsh would reduce habitat capacity for diving and dabbling bird species, which attract birders and recreational users to this area and add a sense of movement and additional color to the ponds when present. Although this sense of movement and color contributes to the character of Charleston Slough, the presence of the birds does not constitute an attribute inherent to the land itself (the effects of the alternatives on the birds themselves are assessed in Section 3.5, Biological Resources). Furthermore, the transition of Charleston Slough to continuous tidal marsh would introduce its own set of avian species to the area. When considered within the context of the SBSP Restoration Project as a whole, the changes to Charleston Slough would be consistent with the existing visual character of the project area. Views of Charleston Slough and Pond A1 would be visually similar to views of natural marshes and restored marshes around the South Bay. Thus, the alteration of the views and visual character of the Mountain View Ponds caused by Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than significant

Alviso-A8 Ponds

Alternative A8: A (No Action). Under Alternative A8 A (the No Action Alternative), the A8 Ponds would continue to function as muted tidal ponds. The United States Fish and Wildlife Service (USFWS) would continue to operate and maintain these ponds in accordance with the AMP and other Refuge management documents and practices that have been in place since the implementation of Phase 1 actions. Under the No Action Alternative, views of this pond cluster would remain the same, and there would be no alteration of views in the A8 Ponds.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. The A8 Ponds would remain muted tidal ponds under Alternative A8 B. However, two habitat transition zones would be constructed from upland fill material and/or dredge material. The transition zones would be built along the southern corners of Pond A8S, introducing vegetation and a small amount of wildlife habitat to this otherwise sparsely vegetated pond. These alterations would be notable for their changes in the color, texture, and movement of the visual environment, as wildlife activity is attracted to the area. These changes would constitute a minor visual enhancement and would not significantly detract from or adversely impact the views or visual character of the A8 Ponds.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A (the No Action Alternative), the Ravenswood Ponds would continue to be managed through the activities described in the AMP and other Refuge management documents and practices, existing as in their current state as seasonal ponds that receive rainfall and some runoff in the winter. Under Alternative A, views of this pond cluster would remain the same, and there would be no alteration of the views or visual character of the Ravenswood Ponds.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Alternative Ravenswood B would open Pond R4 to tidal flows to restore it to tidal marsh, improve levees to provide additional flood protection, create an upland transition zone along the western edge of Pond R4, convert Ponds R5 and S5 to enhanced managed ponds to improve habitat for ducks and various dabbling birds, enhance Pond R3 for western snowy plover, increase pond connectivity, and improve public access features. Views of Ponds R4, R5, and S5 would change due to increased tidal action and the activity/motion created by increased usage of Ponds R5 and S5 by diving and dabbling ducks and birds. Opening Pond R4 to tidal action would change the color and texture of this pond as the surface transitions from salt panne to a vegetated tidal marsh over time. The immediate addition of a habitat transition zone on the west edge of Pond R4 would introduce a similar change in color and texture, but the change would be more abrupt, because the habitat transition zone would be constructed purposefully over a specified period, whereas the tidal mudflat would develop more gradually over time.

A low fence would be constructed along the southern edge of Ponds R3 and S5 (adjacent to the existing Bay Trail spine) to prevent wildlife from entering the Bay Trail or roadway and to discourage Bay Trail users from entering wildlife habitat. The fence would be less than 4 feet tall and would not disrupt views of the salt ponds from the Bay Trail. Also, the fence would be barely noticeable from the northern edges of Ponds R4, R5 and S5. Essentially, the changes to Pond R4 would be visually similar to the appearance of the bordering Greco Island Pond (Figure 3.16-6).

The activities of the SBSP Restoration Project at the Ravenswood Ponds would be highlighted to recreational users by the inclusion of a viewing platform near the border of Ponds R4 and R5. The purpose of the platform would be to educate users on the new features of the pond complex and invite viewers to examine the landscape in greater detail. These changes would be compatible with the surrounding visual environment. Phase 2 would change the mostly barren salt panne in Ponds R4, R5, and S5, characterized by brown- and white-crusted soils intermixed with sparse clusters of weedy vegetation, to one of functioning tidal marsh. Tidal marsh habitat is characterized by low-lying, thick vegetation that ranges from muted greens to brown. Tidal marsh habitat would be interwoven with the sinuous slough channels. The alteration in color and texture caused by the gradual change from salt panne to tidal marsh would be beneficial to the views and overall visual character of the Ravenswood Ponds and improve the overall quality of the scenic environment within South San Francisco Bay. Therefore, this impact would be considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood B Level of Significance: Less than significant (CEQA); Beneficial (NEPA)

Figure 3.16-6. Current Pond R4 (left); Greco Island (right)

Alternative Ravenswood C. Alternative Ravenswood C would be similar to Alternative Ravenswood B with the following exceptions:

- Ponds R5 and S5 would be a managed ponds that are enhanced and modified to approximate a tidal mudflat to create habitat for shorebirds and provide a different type of visual recreation experience than the other Ravenswood alternatives.
- An additional water control structure would be added to Pond R3 to further improve habitat for western snowy plover.
- A large habitat transition zone would be constructed along the northern edge of the AAC.
- Additional recreation and public access components would be constructed.

The visual impacts of Alternative Ravenswood C would be predominantly the same as for Alternative Ravenswood B. However, in Alternative C Ponds R5 and S5 would not be as consistently full of water as they would in Alternative Ravenswood B; they would be more frequently exposed intertidal mudflat. Pond R4 would have more constructed vegetated areas with the inclusion of the habitat transition zone along the AAC, increasing the magnitude of the change in color and the intensity. A boardwalk trail and a new viewing platform would be installed at the northwestern corner of Pond R4 to encourage recreational users to appreciate long-range views of the Bay. A recreational trail would be constructed along the eastern border levees of Ponds R5 and S5 that would run across a raised and improved reconfiguration of the existing levees, creating a negligible visual change when seen from afar but enhancing the viewing areas by opening them to recreational use. These changes would be compatible with the surrounding visual environment. Similar to Alternative Ravenswood B, Alternative Ravenswood C would instigate beneficial changes in the overall views and visual character of the Ravenswood Ponds and improve the overall quality of the scenic environment within South San Francisco Bay. Therefore, this impact is considered less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood C Level of Significance: Less than significant (CEQA); Beneficial (NEPA)

Alternative Ravenswood D. Alternative Ravenswood D can be thought of as a combination of Alternatives Ravenswood B and Ravenswood C. Ponds R5 and S5 would be enhanced managed ponds, as described in Alternative Ravenswood B, and Pond R3 would be enhanced for western snowy plover, as in Alternative Ravenswood C. There would be two habitat transition zones in Pond R4, as in Alternative Ravenswood C. A recreational trail along the northwestern levee of Pond R4 would be added, ending in a viewing platform. These added recreational features would increase awareness of the visual landscape in general and provide recreational users with more opportunity to experience the visual environment and view wildlife, the restoration project, and the Bay itself.

The City of Redwood City's Bayfront Canal and Atherton Channel Project would involve constructing a hydrological connection between these pieces of storm drain infrastructure, Flood Slough, and the triangular forebay to Pond S5. This aspect of the project would add more water pipes and water control structures than is planned for Alternative Ravenswood B. But these pipes would be underground and connected to existing ditches. Similar to the water control structures described in Alternative B, these structures would not create significant impacts to the existing visual character or quality within the Ravenswood pond complex.

All of these changes would be compatible with the surrounding visual environment and would not significantly alter views of the SBSP Restoration Project area. As with Alternatives Ravenswood B and Ravenswood C, Alternative Ravenswood D would improve the views and the overall quality of the scenic environment within the Ravenswood pond cluster and overall South San Francisco Bay. Therefore, the impact of Alternative D would be less than significant under CEQA and beneficial under NEPA.

Alternative Ravenswood D Level of Significance: Less than significant (CEQA); Beneficial (NEPA)

Impact Summary

The Phase 2 impacts and levels of significance for visual resources are summarized in Table 3.16-1. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, and the AMP and other Refuge management documents and practices. The visual resources analysis required no project-level mitigation measures to reduce the impacts to a level that was less than significant.

Table 3.16-1 Phase 2 Summary of Impacts – Visual Resources

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.16-1: Alter views of the SBSP Restoration Project areas.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/ B	LTS/ B	LTS/ B

Notes:
Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).
B = Beneficial
LTS = Less than Significant
NI = No Impact

3.17 Greenhouse Gas Emissions

This section of the Final Environmental Impact Statement/Environmental Impact Report (referred to throughout as the Final EIS/R) describes the existing greenhouse gas (GHG) emissions within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on GHG emissions. The information presented is based on a review of existing GHG emissions and climate change within the area and other pertinent federal, state and local regulations, which are presented in the regulatory framework setting section. Using this information as context, an analysis of the GHG-related environmental impacts of the project is presented for each alternative. The program-level mitigation measures described in Chapter 2, Alternatives, would be implemented with the project. Therefore, this section only includes additional, project-level mitigation measures as needed.

3.17.1 Physical Setting

Methodology

This Phase 2 document generally tiers off the 2007 South Bay Salt Pond Restoration Project Environmental Impact Statement/Environmental Impact Report (2007 EIS/R), which did not evaluate GHG emissions. California Senate Bill (SB) 97, enacted in 2007, addressed the need to analyze GHG emissions as a part of the California Environmental Quality Act (CEQA) process. As directed by SB 97, the Office of Planning and Research (OPR) prepared and developed amendments to the CEQA Guidelines for GHG emissions. These amendments were subsequently adopted by the California Natural Resources Agency on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations.

This section supplements the SBSP Restoration Project 2007 EIS/R. This section provides a brief summary of the basis for climate change and impacts based on scientific studies published by various federal, state, and international agencies and organizations. The methods of analysis and thresholds of significance are based on the Bay Area Air Quality Management District's (BAAQMD's) 2011 Air Quality Guidelines (BAAQMD 2010a, 2011).

This section describes the climate change impacts associated with project GHG emissions. Because no single project is large enough to result in a measurable increase in global concentrations of GHG emissions, the global warming impacts of a project are considered on a cumulative basis. Because climate change issues are global in nature, this section will provide a discussion of national, statewide, and global GHG emission sources and inventories to provide context on a larger scale.

Regional Setting

Climate Change and Global Warming

Radiation from the sun is the primary source of energy keeping the earth warm enough for life. As solar radiation enters the earth's atmosphere, a portion of the radiation passes through the atmosphere and is absorbed by the earth's surface (this is primarily radiation in the visible portion of the electromagnetic spectrum), a portion is reflected back toward space, and a portion is absorbed by the upper atmosphere. The radiation absorbed by the earth heats the earth's surface, which then emits infrared radiation. Because the earth has a much lower temperature than the sun, it emits longer-wavelength radiation.[1] Certain gases in the earth's atmosphere, classified as greenhouse gases (i.e., GHGs), play a critical role in determining the earth's surface temperature. GHGs have strong absorption properties at wavelengths that are emitted by the earth. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on Earth.

Anthropogenic emissions of GHGs are widely accepted in the scientific community as contributing to global climate change. The Intergovernmental Panel on Climate Change was commissioned by the World Meteorological Organization and United Nations Environment Program to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. According to *Climate Change, 2007: The Physical Science Basis, Summary for Policymakers* (IPCC 2007), there is no doubt that the climate is warming. Global average air and ocean temperatures and global average sea level are rising. The period from 1995 through 2006 ranked as among the warmest on record since 1850. Although some of the increase is explained by natural occurrences, IPCC 2007 asserts that the increase in temperature is very likely (greater than a 90 percent probability) caused by human activity, most notably from the burning of fossil fuels.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and toxic air contaminants, which are pollutants of regional and local concern. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and other pollutants. Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. The impacts from each of these other GHGs besides CO_2 are often converted to carbon dioxide equivalent (CO_2e) by multiplying the mass of a GHG by its Global Warming Potential (GWP) to measure how much global warming a given type and mass of a particular GHG may cause using the equivalent mass of CO_2. [2] Global sinks of CO_2 include uptake by vegetation and dissolution into the ocean (IPCC 2007).

For California, projected effects from climate change are described in *Our Changing Climate: Vulnerability and Adaptation to the Increasing Risks from Climate Change* (California Climate Change Center 2012). Projections using climate modeling indicate that temperatures in California are expected to rise between 4.1 and 8.6 degrees Fahrenheit by the end of the century, depending on how much California and the rest of the globe's emitters are able to reduce GHG emissions. These temperature increases will negatively affect public health, water supply, agriculture, plant and animal species, and the coastline (California Climate Change Center 2012).

[1] The wavelength at which a body emits radiation is proportional to the temperature of the body.

[2] CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the GWP of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in the General Reporting Protocol 2.0 of The Climate Registry (TCR 2014), 1 metric ton of methane has the same contribution to the greenhouse effect as approximately 25 metric tons of carbon dioxide, so its GWP is 25. Therefore, methane is a much more potent GHG than carbon dioxide. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only carbon dioxide were being emitted. The GWP for nitrous oxide is 298, making it an even more potent GHG than methane.

To determine the projected changes in California, well-established climate models were used to project the future climate. The changes in the future climate were found to affect the natural environment in California in the following general ways (California Climate Change Center 2012):

- More frequent, hotter, and longer heat waves, with fewer extremely cold nights;
- Greater numbers of large wildfires burning larger areas;
- Reduced snow pack and stream flow from the Sierra Nevada, affecting winter recreation and water supply;
- Public health impacts from heat waves, including higher temperatures, which will increase ground-level ozone levels;
- Increased electricity demand for cooling in the summer and reduced energy supply from hydropower;
- Accelerated sea-level rise threatening coastal infrastructure and increasing the risk of coastal flooding to vulnerable populations;
- Changes in growing season conditions that may affect agriculture, causing variations in crop quality and yield; and/or
- Changes in distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 37 million to 50 million by 2050 (California Department of Finance 2013). Therefore, the number of people potentially affected by climate change—and the amount of anthropogenic GHG emissions anticipated under a "business as usual" scenario—is expected to increase. Similar changes as those noted above for California are also expected occur in other parts of the world, with regional variations in resources affected and vulnerability to adverse effects.

Anticipated impacts from climate change affecting the San Francisco Bay Area include sea-level rise (threatening coastal areas, San Francisco Bay [Bay] and its associated shoreline habitats, and the Sacramento–San Joaquin River Delta as well as key infrastructure), reduced Sierra snowpack (a main component of the Bay Area's water supply), an increased number of high-heat days and wildfires, and higher levels of air pollution (BAAQMD 2010b). These changes could result in diminished water supply availability and quality, reduced agricultural production, risks to coastal wetland ecosystems, and public health impacts (CEC 2012).

One of the major goals of the SBSP Restoration Project is to maintain or improve current levels of flood protection. To that end, the project designs include a number of features intended to address flood protection. Most of these issues are addressed in Section 3.2, Hydrology, but it is worth noting here that protection from flooding associated with future sea-level rise (and thus with GHG emissions and climate change) is added by the establishment of tidal marshes and habitat transition zones, both of which are central features of the project. Thus, the SBSP Restoration Project is expected to be part of the long-term adaptation to climate change-related issues in the South Bay.

Greenhouse Gas Emissions

Whereas the effects of traditional air quality pollutants and toxic air contaminants are local, the impacts of GHGs are largely global. The quantity of GHGs that it takes to cause a change in climate is not precisely known; however, the quantity is enormous, and no single project alone would be expected to measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimate changes. The estimated global annual emission of anthropogenic GHGs was 49 billion metric tons in 2004. Of this, agriculture was estimated to contribute 13.5 percent (IPCC 2007). This compares with the estimated emissions from California of 0.484 billion metric tons in 2004 or 0.99 percent of the global emissions.

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the burning of fossil fuels in the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (CEC 2006). Emissions of carbon dioxide are predominantly byproducts of fossil fuel combustion. Methane is a highly potent GHG that results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) largely associated with agricultural practices and landfills. Carbon dioxide sinks, or reservoirs, include vegetative growth (which converts carbon dioxide to biomass) and the ocean, which absorbs carbon dioxide through photosynthesis by phytoplankton and dissolution, respectively, two of the most common processes of carbon dioxide sequestration (IPCC 2007).

California produced 448.1 teragrams (Tg) (or million metric tons) of CO_2e in 2011 (CARB 2013b). Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions, accounting for 37.6 percent of total GHG emissions in the state.

Project Setting

This section focuses on GHG emissions from the Phase 2 activities.

Existing Conditions

The existing project area consists of salt ponds and adjacent habitats. There have been many studies on the greenhouse gas impacts of wetlands and tidal salt marshes, particularly regarding their potential to produce methane and their ability to sequester carbon (Trulio et al. 2007). GHG emissions and sequestration associated with these land use changes are difficult to quantify, because these effects are somewhat speculative for wetland areas and can vary greatly, depending on the specific time frame of interest, the characteristics of the wetland, geology, climate, and other factors. The emissions and sequestration are typically addressed in a qualitative manner, discussing some of the anticipated outcomes based on evolving scientific studies. Later in this section, however, the GHG emissions from Phase 2 project implementation are estimated and related to larger regional emissions, and the carbon sequestration potential of the tidal marsh wetlands that would be added under different Phase 2 actions is also estimated. The potential for methane emissions are not quantified.

Currently, the Alviso-Mountain View Ponds contain recreational uses. Recreational uses are also adjacent to the Ravenswood Ponds and near the Alviso-A8 Ponds. The project areas are indirect sources of mobile GHG emissions from recreational users accessing the site. Mobile emissions may also be generated by United States Fish and Wildlife Service (USFWS) staff and others (e.g., Pacific Gas and Electric Company [PG&E] staff and contractors) accessing the project areas to perform Adaptive Management Plan (AMP) monitoring, research, and operations and maintenance (O&M) activities of facilities within and near the pond clusters. These O&M activities typically involve the replacement and/or repairs of water control structures, limited levee maintenance and inspection, and trail maintenance. A water intake pump is currently used in Charleston Slough (at the Alviso-Mountain View Ponds) to supply water to the Shoreline Park sailing lake.

3.17.2 Regulatory Setting

Greenhouse gas emissions and sources in the South Bay are regulated by the United States Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and BAAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to attain the directives imposed through legislation. Although USEPA regulations may not be superseded, both state and local regulations may be more stringent.

Federal Laws and Regulations

At the federal level, USEPA implements national programs related to greenhouse gas emissions and climate change under the federal Clean Air Act (CAA) and Clean Air Act Amendments (CAAA).

Federal Clean Air Act

In 2007, in *Massachusetts v. The Environmental Protection Agency*, the United States Supreme Court ruled that GHGs are air pollutants that are covered under the CAA. The court found that USEPA has a mandatory duty to enact rules regulating mobile GHG emissions pursuant to the federal CAA. The court held that GHGs fit the definition of an air pollutant that causes and contributes to air pollution and may reasonably be anticipated to endanger public health or welfare. In 2009, the USEPA Administrator found that the current and projected concentrations of GHGs threaten public health and welfare of current and future generations and that combined emissions from new motor vehicles contribute to GHG pollution. USEPA's endangerment finding covers emissions of six key GHGs: CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Mobile Source Regulations

On August 9, 2011, USEPA and the National Highway Traffic Safety Administration (NHTSA) announced standards to reduce GHG emissions and improve fuel efficiency for heavy-duty trucks and buses. On October 15, 2012, USEPA and NHTSA established a program to reduce GHG emissions and improve fuel economy standards for new cars and light trucks through 2025 (USEPA 2012a).

Stationary Source Regulations

To address large stationary emitters of GHGs, the USEPA also established mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year. On May 13, 2010, Clean Air Act permitting programs were tailored to cover the nation's largest GHG emitters: power plants, refineries, and cement production facilities. On March 27, 2012, the USEPA proposed a Carbon Pollution Standard for new power plants that would, for the first time, set limits on the amount of carbon pollution emitted by power plants (USEPA 2012b). On September 20, 2013, this proposal was withdrawn, and a new proposal was issued with a revised approach that would set separate standards for natural-gas-fired turbines and coal-fired units.

Council on Environmental Quality Guidance

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released draft guidance on the consideration of GHGs in NEPA documents for federal actions. The draft guidelines included a presumptive threshold of 25,000 metric tons of CO_2e emissions from a proposed action to trigger a quantitative analysis. CEQ has not established when GHG emissions are "significant" for NEPA purposes, but rather poses that question to the public (CEQ 2010).

On June 4, 2012, CEQ finalized an Update to the 2010 Guidance on Federal GHG Accounting and Reporting (CEQ 2012). The guidance establishes requirements for federal agencies in calculating and reporting GHG emissions associated with agency operations under Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance. Under the authority of Executive Order 13514, USFWS has developed a climate change strategy and included sustainability practices within the USFWS Service Manual to reduce and offset GHG emissions and move toward carbon-neutral practices. The USFWS Climate Change Strategic Plan includes Mitigation Goal 5, which aims to change business practices to achieve carbon neutrality by the year 2020. The plan lists objectives to assess and reduce the carbon footprint of the USFWS's facilities, vehicles, workforce, and operations; assess and reduce the USFWS's land management carbon footprint, and offset the remaining carbon balance (USFWS 2010).

State Laws and Regulations

California Air Resources Board

CARB is the agency responsible for coordination and oversight of state and local greenhouse gas programs in California.

California Global Warming Solutions Act (AB 32)

CARB is the lead agency for implementing Assembly Bill (AB) 32, the California Global Warming Solutions Act, adopted by the California Legislature in 2006. AB 32 set statewide targets to reduce GHG emissions to 1990 levels by 2020. AB 32 also requires CARB to prepare a scoping plan containing the main strategies that will be used to achieve reductions in GHG emissions in California.

After receiving public input on their discussion draft of the proposed scoping plan released in June 2008, CARB released the Climate Change Proposed Scoping Plan (Scoping Plan) in October 2008 and adopted the plan on December 12, 2008. This plan contains an outline of the proposed state strategies to achieve the 2020 GHG emission limits. Key elements of the Scoping Plan include the following recommendations:

1. Expanding and strengthening existing energy-efficiency programs and building and appliance standards;
2. Achieving a statewide renewables energy mix of 33 percent;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
4. Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;

5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
6. Creating targeted fees, including a public goods charge on water use, fees on high-GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

Under the Scoping Plan, approximately 85 percent of the state's emissions are subject to a cap-and-trade program that places covered sectors under a declining emissions cap. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emissions reduction from this cap-and-trade program will account for a large portion of the reductions required by AB 32.

CARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. However, in general, this acknowledgement is more relevant to development projects that would change a land use and thus alter emissions from the listed economic sectors than to a restoration project within an area already set aside as a wildlife refuge.

The Scoping Plan was re-approved by CARB in 2011 with amendments to the Functional Equivalent Document. CARB published the First Update to the AB 32 Scoping Plan on May 16, 2014. The update identifies opportunities to leverage existing and new funds to further drive GHG emissions reductions through strategic planning and targeted low-carbon investments. The update defines CARB's climate change priorities for the next 5 years and sets the groundwork to reach long-term goals set forth in California Executive Orders S-03-05 and B-16-2012. CARB identified six key focus areas in the update: energy, transportation, agriculture, water, waste management, and natural and working lands. In the natural and working lands focus area, the following actions were identified as important to reducing future GHG emissions through wetland restoration:

- Develop funding mechanisms to support efforts to restore, conserve, and protect wetlands.
- Restore, conserve, and maintain existing wetlands in addition to creating new areas that were not previously sequestering carbon.
- Avoid wetland degradation and conversion that could potentially reduce sequestration benefits and increase emissions.
- Develop actionable policies and measures that conserve wetland resources that provide high sequestration benefit.
- Pursue research related to measuring carbon sequestration potential that will inform and support management actions that maximize sequestration longevity.

Senate Bill 97

In August 2007, the California Legislature adopted SB 97, requiring OPR to prepare and transmit new CEQA guidelines for the mitigation of GHG emissions or the effects of GHG emissions to the Resources Agency by July 1, 2009. OPR submitted its proposed guidelines to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency undertook the formal rulemaking process to certify and adopt the amendments as part of the state regulations implementing CEQA and adopted the CEQA Guidelines Amendments on December 30, 2009. The amendments became effective on March 18, 2010. In the CEQA Guidelines Amendments, thresholds of significance for GHG emissions was not specified; nor are assessment methodologies or specific mitigation measures prescribed. Instead, the amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but rely on the lead agencies to make their own determinations based on substantial evidence. The CEQA amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

Executive Orders S-03-05 and B-16-2012

In 2005, Governor Schwarzenegger issued Executive Order S-03-05, calling for statewide GHG reductions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Executive Order S-03-05 also called for a coordinated interagency effort to report on progress made toward meeting the greenhouse gas emissions targets and on the impacts of global warming on California. These reports are required biannually,[3] with the latest summary report published in July 2012 (CEC 2012). In March 2012, Governor Brown signed Executive Order B-16-2012, which affirmed the long-range climate goal for California to reduce greenhouse gases to 80 percent below 1990 levels by 2050.

Senate Bill 375

SB 375, the Sustainable Communities and Climate Protection Act of 2008 enhances California's ability to reach its AB 32 goals by promoting good land use and transportation planning, with the goal of more sustainable communities. Sustainable communities require CARB to develop regional GHG emissions reduction targets for 2020 and 2035 for each region covered by one of the state's 18 metropolitan planning organizations (MPOs). The adopted targets for the San Francisco Bay Area MPO, the Metropolitan Transportation Commission (MTC), are 7 percent below 2005 per capita levels by 2020 and 15 percent below 2005 per capita levels by 2035, as set by Executive Order G-11-024.

Assembly Bill 1493

With the passage of AB 1493 in 2002, California launched an innovative and proactive approach for dealing with GHG emissions and climate change at the state level. AB 1493 requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards apply to automobiles and light trucks beginning with the 2009 model year. Although litigation was filed challenging these regulations and USEPA initially denied California's related request for a waiver, a waiver has since been granted (CARB 2013a).

[3] Although the language in the EO requiring these reports states that they should be issued "biannually," the language in these reports refers to "biennial" reports, and the reports have been issued as such (every 2 years) (http://resources.ca.gov/climate/fourth/).

Low Carbon Fuel Standard

Executive Order S-01-07, the Low Carbon Fuel Standard, was issued in January 2007. The order calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The Low Carbon Fuel Standard was approved by CARB in 2009 and became effective on April 15, 2010. The regulation establishes annual performance standards for fuel producers and importers and applies to all fuels used for transportation in California (CARB 2011).

Local Laws and Regulations

Bay Area Air Quality Management District

In 1999, BAAQMD released the BAAQMD CEQA Guidelines (BAAQMD 1999). This advisory document provided thresholds for air quality emissions, but did not provide thresholds for GHG emissions. In 2010, BAAQMD adopted air quality guidance that included quantitative thresholds of significance and recommended Best Management Practices (BMPs) and mitigation measures for GHG emissions, among other pollutants (BAAQMD 2010a).

The thresholds were developed using a "gap-based" threshold, to cover the perceived shortfall between the GHG reductions achieved with the AB 32 Scoping Plan measures and the AB 32 GHG emissions targets. The thresholds were developed based on BAAQMD's expertise and the best-available GHG emissions data and incorporated conservative assumptions for the amount of emissions reductions from legislation to cover the gap (BAAQMD 2009).

The BAAQMD CEQA guidelines did not adopt any significance thresholds for construction-related GHG emissions. Rather, BAAQMD recommended lead agencies to quantify and disclose GHG emissions that would occur during construction and to make a determination on the significance of those emission impacts in relation to meeting the AB 32 GHG reduction goals. BAAQMD also encouraged lead agencies to incorporate BMPs to reduce GHG emissions during construction, as applicable. The BAAQMD CEQA Guidelines included operations-related thresholds of significance for two types of projects: land use development and stationary source projects. For land use development projects, including residential, commercial, industrial, and public land uses and facilities, the threshold was compliance with a qualified GHG reduction strategy or annual emissions of less than 1,100 metric tons of CO_2e or efficiency performance criteria based on service population. For stationary source projects, such as land uses with equipment that emits GHG emissions and would require a BAAQMD permit to operate, the threshold was 10,000 metric tons per year of CO_2e (BAAQMD 2010a).

As discussed for air pollutant thresholds of significance developed by the BAAQMD in Section 3.13, Air Quality, BAAQMD's adoption of the 2010 Thresholds was challenged in court. A court-ordered ruling in the case (*California Building Industry Association v. BAAQMD*, Alameda County Superior Court Case No. RGI0548693) required the BAAQMD thresholds to be subject to further environmental review under CEQA. As a result, the BAAQMD released updated CEQA Guidelines in 2012 (BAAQMD 2012) that removed references to CEQA thresholds. BAAQMD appealed the ruling, and the judgment was reversed on August 13, 2013, by the Court of Appeals of the State of California, First Appellate District. The Court of Appeals' decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending.

The claims made in the case concerned the CEQA impacts of adopting the thresholds, and the court ruling did not specifically address whether the thresholds were supported by "substantial evidence." At this time, the BAAQMD is no longer recommending the use of the 2010 GHG thresholds and instead recommends that lead agencies determine appropriate GHG thresholds of significance based on substantial evidence in the record.

For this GHG analysis and in the absence of other thresholds adopted by the BAAQMD, the 2010 thresholds were used because they were established based on substantial evidence. The BAAQMD released the "Proposed Thresholds of Significance" in 2009, which "provides the *substantial evidence* in support of the thresholds of significance…" (emphasis added) (BAAQMD 2009). Those thresholds for GHG emissions were developed by relying on reasonable, environmentally conservative assumptions on growth in the land use sector, predicted emissions reductions from statewide regulatory measures and the resulting emissions inventories, and the efficacy of GHG mitigation measures.

The issues identified in the BAAQMD CEQA Air Quality Guidelines' court case are not considered relevant to the scientific soundness of the BAAQMD's analysis of the level at which GHG emissions would potentially have a significant impact. Therefore, the usage of these 2010 thresholds is consistent with the BAAQMD's direction that thresholds should be based on substantial evidence.

2010 Bay Area Clean Air Plan

The latest Clean Air Plan was adopted in September 2010 (BAAQMD 2010b). The 2010 Clean Air Plan includes a comprehensive strategy to reduce ozone, particulate matter, air toxics, and GHGs from stationary, mobile, and transportation sources. The Clean Air Plan's performance objectives are to reduce GHG emissions to 1990 levels by 2020 and to 40 percent below 1990 levels by 2035 and are consistent with CARB's GHG reduction goals. The plan includes control measures that will directly reduce GHG emissions and many other measures that will reduce GHGs as a co-benefit. Applicable measures include offering retrofit incentives and encouraging alternative fuel use for off-road equipment (MSM C-1) and on-road heavy duty vehicles (MSM B-1 and MSM B-2).

Plan Bay Area

On July 18, 2013, MTC and the Association of Bay Area Governments (ABAG) approved the Plan Bay Area. The plan includes the Sustainable Communities Strategy (SCS) for the Bay Area, in accordance with SB 375 and the 2040 Regional Transportation Plan. The plan includes integrated land use and transportation strategies for the region. The plan was developed through OneBayArea, a joint initiative between ABAG, BAAQMD, MTC, and the Bay Conservation and Development Commission (BCDC). The plan's transportation policies focus on maintaining the extensive existing transportation network and utilizing these systems more efficiently to handle density in Bay Area transportation cores (ABAG and MTC 2013).

Many nearby Bay Area counties and cities have adopted greenhouse gas policies and climate action plans that contain strategies to reduce greenhouse gas emissions. Applicable items from these plans include the following:

- City of Menlo Park Climate Change Action Plan. Community Strategies: Limit commercial vehicle idling (City of Menlo Park 2009).
- Redwood City Community Climate Action Plan. Align city goals and efforts with state legislation; reduce overall GHG emissions; connect people to their environment (City of Redwood City 2013).

- Mountain View Greenhouse Gas Reduction Program. Compliance with Climate Action Plan (CAP) based on consistency with mandatory and voluntary GHG reduction measures (City of Mountain View 2012).
- Greenhouse Gas Reduction Strategy for the City of San Jose. Compliance with CAP based on consistency with General Plan Land Use and Transportation policies (City of San Jose 2011).
- City of Fremont Climate Action Plan. Strategy 2, Cleaner Fuels. Switch to fuels that produce low or zero carbon dioxide emissions (City of Fremont 2012).
- City of Sunnyvale Draft Climate Action Plan. Measure OR-2, Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles. Compliance checklist for GHG reduction measures will be developed after draft CAP is adopted (City of Sunnyvale 2011).
- City of Milpitas Climate Action Plan and Qualified Greenhouse Gas Reduction Strategy. Goal 12, Support the expansion and use of clean technology off-road equipment. Measure 12.2, Construction Best Management Practices, Encourage construction projects to comply with BAAQMD performance-based BMPs. CAP contains a compliance checklist for applicable measures. Local GHG reduction target of 15 percent below 2005 baseline emissions levels by 2020 (City of Milpitas 2013).
- City of Palo Alto Climate Protection Plan. Zero Waste Goals and Actions, Increase diversion percentage and amount of materials salvaged for reuse through modified construction and demolition debris ordinance (City of Palo Alto 2007).

3.17.3 Environmental Impacts and Mitigation Measures

Approach to Analysis

The assumptions presented in Sections 3.13, Air Quality, and 3.12, Noise, regarding the types and durations of use of construction equipment and equipment used following construction also apply to this greenhouse gas and climate change impact analysis.

Significance Criteria

For the purpose of this analysis, the project would have a significant GHG or climate change impact if it were to:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an agency’s applicable plan, policy, or regulation designed to reduce GHG emissions.

As stated in Appendix G of the CEQA Guidelines (AEP 2014), the significance standards established by the applicable air quality management or air pollution control district may be used to evaluate impacts.

According to the BAAQMD CEQA guidelines (BAAQMD 2010a), there are thresholds for evaluating GHG emissions from projects and plans and developed guidelines for assessing these impacts for direct and indirect operational emissions. These thresholds include:

1. A bright line emissions threshold of 1,100 metric tons of CO_2e per year;
2. An emissions efficiency metric of 4.6 tons of CO_2e per year per service population; [4] or
3. Consistency with a qualified GHG Reduction Strategy.

The BAAQMD has not adopted any thresholds for evaluating GHG emissions from construction activities. However, other districts, including the South Coast Air Quality Management District and the San Luis Obispo County Air Pollution Control District, have recommended that GHG emissions from construction and short-term sources be amortized over the lifetime of the project for comparison with significance thresholds (SCAQMD 2008; SLOAPCD 2012). For the analysis in this EIS/R, the construction GHG emissions will be amortized over the lifetime of the project (assuming a 50-year project life) and compared to the bright line emissions threshold of 1,100 metric tons of CO_2e per year, in addition to construction-related BMPs, to evaluate the significance of these emissions. Impact evaluations for the Action Alternatives are assessed based on the existing conditions described in Section 3.17.2, Regulatory Setting, above, and not the conditions that would occur under the No Action Alternative. This approach mimics the evaluation contained in the 2007 EIS/R. In this case, the No Action Alternative represents no change from current management direction or level of management intensity provided in the AMP.

As explained in Section 3.1.2, Environmental Setting and Impact Analysis, although both the CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation Summary

The SBSP Restoration Project 2007 EIS/R evaluated the program-level impacts of the project. Following the analytical standards of the time (2007), impacts related to climate change and GHG emissions were not evaluated.

Project-Level Evaluation

Overview

GHG emissions from construction and operational activities were evaluated for all alternatives at each pond cluster.

Construction

Construction GHG emissions were calculated using the methodologies and assumptions described in Section 3.13, Air Quality. Detailed modeling input assumptions and output results are provided in Appendix H. Construction GHG emissions for the Phase 2 pond clusters and alternatives are shown in Tables 3.17-1 to 3.17-4.

[4] Service population is the sum of new residents and full time workers.

Table 3.17-1 Alviso-Island Ponds Construction Emissions Summary

ALTERNATIVE	CO_2E EMISSIONS
Alternative Island A (No Action)	
Construction emissions (metric tons)	—
Amortized construction emissions (metric tons/year)	—
Alternative Island B	
Construction emissions (metric tons)	111.41
Amortized construction emissions (metric tons/year)	2.23
Alternative Island C	
Construction emissions (metric tons)	190.21
Amortized construction emissions (metric tons/year)	3.80
Note: Amortized emissions assume a 50-year project lifetime.	

Table 3.17-2 Alviso-Mountain View Ponds Construction Emissions Summary

ALTERNATIVE	CO_2E EMISSIONS
Alternative Mountain View A (No Action)	
Construction emissions (metric tons)	—
Amortized construction emissions (metric tons/year)	—
Alternative Mountain View B	
Construction emissions (metric tons)	836.21
Amortized construction emissions (metric tons/year)	16.72
Alternative Mountain View C	
Construction emissions (metric tons)	934.12
Amortized construction emissions (metric tons/year)	18.68
Note: Amortized emissions assume a 50-year project lifetime.	

Table 3.17-3 Alviso-A8 Ponds Construction Emissions Summary

ALTERNATIVE	CO_2E EMISSIONS
Alternative A8 A (No Action)	
Construction emissions (metric tons)	—
Amortized construction emissions (metric tons/year)	—
Alternative A8 B	
Construction emissions (metric tons)	238.22
Amortized construction emissions (metric tons/year)	4.76
Notes: Amortized emissions assume a 50-year project lifetime.	

Table 3.17-4 Ravenswood Ponds Construction Emissions Summary

ALTERNATIVE	CO_2E EMISSIONS
Alternative Ravenswood A (No Action)	
Construction emissions (metric tons)	—
Amortized construction emissions (metric tons/year)	—
Alternative Ravenswood B	
Construction emissions (metric tons)	167.84
Amortized construction emissions (metric tons/year)	3.36
Alternative Ravenswood C	
Construction emissions (metric tons)	325.46
Amortized construction emissions (metric tons/year)	6.51
Alternative Ravenswood D	
Construction emissions (metric tons)	265.40
Amortized construction emissions (metric tons/year)	5.31
Note: Amortized emissions assume a 50-year project lifetime.	

Operations

As discussed in Section 3.13, Air Quality, operations at the pond clusters under the No Action Alternatives and the Action Alternatives would involve off-road equipment usage and on-road vehicle activity during O&M and adaptive management activities. These activities would generate GHG emissions; however, neither the No Action Alternatives nor the Action Alternatives are expected to substantially increase the level of operational activity at any of the pond clusters. Therefore, operational activities and operational GHG emissions at the pond clusters would be similar to existing conditions under the No Action and the Action Alternatives.

As discussed in project settings, the existing project area consists of former salt ponds and adjacent habitats that have the potential to produce methane and to sequester carbon. Quantification of methane emissions would be largely speculative and were therefore not included. The potential for restored tidal marshes to sequester carbon was estimated; the results are presented in Impact 3.17-2.

Phase 2 Impact 3.17-1: Construction-Generated GHG Emissions

Alviso-Island Ponds

Alternative Island A (No Action). Under this alternative, no construction activities would occur within the Alviso-Island Ponds. Although limited O&M activities would be ongoing, they are considered part of baseline operations and not construction. As such, no construction-generated GHG emissions would occur.

Long-term operational GHG emissions for this alternative are evaluated in Phase 2 Impact 3.17-2, below.

Alternative Island A Level of Significance: No Impact

Alternative Island B. Implementation of this alternative would involve removal, breaching, and lowering of levees. Earthmoving activity would occur under this alternative, but materials would be used on-site and not require off-site hauling trips. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment and vehicle activity.

Alternative Island B would generate construction GHG emissions. These construction-related GHG emissions under Alternative Island B were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-1, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. Furthermore, the project would implement several BMPs, developed by the State Coastal Conservancy, to be implemented as feasible, that would reduce GHG emissions during construction. These BMPs include incorporation of low-carbon fuels and alternative fuels in construction equipment and vehicles, use of newer engines in off-road equipment, enforcement of equipment idling limits, electrification of equipment, and reduction of vehicle miles traveled (VMT) for worker trips and hauling trips through implementation of VMT reduction plans (SCC 2011). For these reasons, this impact would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. Implementation of this alternative would involve excavation of pilot channels and the removal, breaching, widening, and lowering of levees. Earthmoving activity would occur under this alternative, but materials would be used on-site and not require off-site hauling trips. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment and vehicle activity.

Alternative Island C would generate construction GHG emissions. Construction GHG emissions from Alternative Island C would be higher than for Alternative B. These construction-related GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-1, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement California State Coastal Commission (SCC)-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under this alternative, no construction activities would occur within the Alviso-Mountain View Pond Cluster. Although limited O&M activities would be ongoing, they are considered part of baseline operations and not construction. As such, no construction-generated GHG emissions would occur.

Long-term operational GHG emissions for this alternative are evaluated in Phase 2 Impact 3.17-2, below.

Alternative Mountain View A Level of Significance: No Impact

Alternative Mountain View B. Implementation of this alternative would involve levee improvements, creation of nesting islands, creation of tidal habitat, and construction of recreational facilities. Approximately 296,400 cubic yards (cy) of material would be transported from off-site locations. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment, material hauling, and worker commute activity.

Alternative Mountain View B would generate construction GHG emissions. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-2, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Implementation of this alternative would involve levee improvements, creation of nesting islands, creation of tidal habitat, and construction of recreational facilities. Approximately 369,900 cy of material would be transported from off-site locations. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment, material hauling, and worker commute activity.

Alternative Mountain View C would generate construction GHG emissions. Construction GHG emissions from Alternative Mountain View C would be less than for Alternative Mountain View B. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-2, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under this alternative, no construction activities would occur within the Alviso-A8 Ponds. Although limited O&M activities would be ongoing, they are considered part of baseline operations and not construction. As such, no construction-generated GHG emissions would occur.

Long-term operational GHG emissions for this alternative are evaluated in Phase 2 Impact 3.17-2, below.

Alternative A8 A Level of Significance: No Impact

Alternative A8 B. Implementation of this alternative would involve creation of habitat transition zones (HTZs). Approximately 190,000 cy of material would be transported from off-site locations. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment, material hauling, and worker commute activity.

Alternative A8 B would generate construction GHG emissions. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-3, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under this alternative, no construction activities would occur within the Ravenswood Ponds. Although limited O&M activities would be ongoing, they are considered part of baseline operations and not construction. As such, no construction-generated GHG emissions would occur.

Long-term operational GHG emissions for this alternative are evaluated in Phase 2 Impact 3.17-2, below.

Alternative Ravenswood A Level of Significance: No Impact

Alternative Ravenswood B. Implementation of this alternative would involve levee modifications, creation of tidal habitat, constructing habitat transition zones, installation of water control structures, creation of nesting habitat, and construction of recreational facilities. Approximately 37,900 cy of material would be transported from off-site locations. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment, material hauling, and worker commute activity.

Alternative Ravenswood B would generate construction GHG emissions. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-4, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. Implementation of this alternative would involve levee modifications, creation of tidal habitat, constructing habitat transition zones, installation of water control structures, creation of nesting habitat, excavation of pilot channels, raising pond bottoms, and construction of recreational facilities. Approximately 210,400 cy of material would be transported from off-site locations. Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment, material hauling, and worker commute activity.

Alternative Ravenswood C would generate construction GHG emissions. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in

Table 3.17-4, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. Implementation of this alternative would involve levee modifications, creation of tidal habitat, constructing habitat transition zones, installation of water control structures, creation of nesting habitat, and construction of recreational facilities. Because Alternative Ravenswood D would have a surplus of fill on-site that can be used, no net import of fill from off-site locations would be required (the other Ravenswood Action Alternatives would not have this surplus). Construction activities would result in the generation of GHG emissions from exhaust from off-road equipment and worker commute activity.

Alternative Ravenswood D would generate construction GHG emissions. The construction GHG emissions were amortized over the lifetime of the project (assumed to be 50 years). As shown in Table 3.17-4, above, amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year. As discussed in Alternative Island B, the project would also implement SCC-developed BMPs to the extent they are feasible that would further reduce construction GHG emissions. For these reasons, this impact would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Phase 2 Impact 3.17-2: Operational GHG Emissions

Alviso-Island Ponds

Alternative Island A (No Action). Operations under Alternative Island A (No Action) would involve limited O&M activities, such as levee repair, railroad track maintenance, and biological surveys. These activities would occur intermittently over the lifetime of the project. O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities. Therefore, potential impacts from long-term operational GHG emissions would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternatives Island B and Island C (Action Alternatives). Operations under the Island Action Alternatives would be similar to that described for Alternative Island A (No Action). There would be no new public access or recreation improvements to these ponds, and there would be no projected change in recreation use as a result. Therefore, the level of operational activity would be similar to existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities.

As tidal marsh vegetation establishes and spreads, the project is expected to increase carbon sequestration at the pond cluster over the lifetime of the project. There is not yet any CARB-approved protocol for establishing carbon credits for wetland establishment, whether through a restoration project or otherwise, and estimates of the amount of carbon dioxide sequestered per acre of tidal marsh vary. However, using natural wetlands' carbon sequestration rates (Callaway et al. 2012); a reasonable value is 79 grams of carbon per square meter per year (g C/m^2-yr). Using Verified Carbon Standard's (VCS's) Methodology for Tidal Wetland and Seagrass Restoration (Silverstrum and Crooks 2013); successful tidal marsh establishment at the Island Ponds would result in over 450 acres of vegetation that could sequester approximately 159 tons of carbon per year.

For these reasons, potential impacts from long-term operational GHG emissions would be less than significant.

Island Action Alternatives Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Operations under Alternative Mountain View A (No Action) would involve limited O&M activities, such as levee repair, operations and replacement of water control structures, trash removal, and biological surveys. These activities would occur intermittently over the lifetime of the project. A water intake pump is currently used to supply water to the sailing lake in the City of Mountain View's Shoreline Park. Operation of the pump would continue under this alternative. O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities. Therefore, potential impacts from long-term operational GHG emissions would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternatives Mountain View B and Mountain View C (Action Alternatives). Operations under the Mountain View Action Alternatives would be similar to that described for Alternative Mountain View A. Therefore, the level of operational activity would be similar to existing conditions, though with slightly higher emissions for some activities. Among these activities are increased visits by maintenance staff for inspecting the HTZs, removing invasive weeds, or controlling mosquito habitat, but these activities would not generate notable increases in GHG emissions. Alternative Mountain View C would have somewhat higher emissions because of the increased pumping distance associated with the relocation of the water intake for Shoreline Park's sailing lake. Alternative B would also include a new trail, viewing platform, and interpretative platform, which may result in small increases in recreational visits. Alternative Mountain View C would also include additional new trails, viewing platforms, and interpretative platforms, which may result in increased recreational visits relative to Alternative Mountain View B. However, the adjacent Shoreline Park and Bay Trail segments are already recreational areas that receive very high use by recreational visitors. The relatively minor improvements and additional trails and viewing and interpretive platforms are expected to cause minor increases in visitation relative to the baseline. These projected increases are presented in Section 3.6, Recreation, and its technical appendix. Additional emissions from these increases in visitation would not result in a substantial increase in GHG emissions compared to existing operational activities.

The project would be expected to increase carbon sequestration at the pond cluster over the lifetime of the project. Using natural wetlands' carbon sequestration rates (Callaway et al. 2012) and VCS's Methodology for Tidal Wetland and Seagrass Restoration (Silverstrum and Crooks 2013), successful tidal marsh establishment under Alternative Mountain View B would result in over 710 acres of vegetation that could sequester approximately 250 tons of carbon per year. Tidal marsh establishment under Alternative

Mountain View C would result in over 825 acres of vegetation that could sequester approximately 291 tons of carbon per year.

For these reasons, potential impacts from long-term operational GHG emissions would be less than significant.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Operations under Alternative A8 A (No Action) would involve limited O&M activities, such as levee repair, O&M of water control structures, and biological surveys. These activities would occur intermittently over the lifetime of the project. O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities. Therefore, potential impacts from long-term operational GHG emissions would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. Operations under Alternative A8 B would be similar to that described for Alternative A8 A. Visits by maintenance staff for inspecting the HTZs, removing invasive weeds, or controlling mosquito habitat would increase, but these activities would not generate notable increases in GHG emissions. There would be no new public access or recreation improvements to these ponds, and there would be no projected change in recreation use as a result. Thus, the level of operational activity would be similar to existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities. Therefore, potential impacts from long-term operational GHG emissions would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Operations under Alternative Ravenswood A (No Action) would involve limited O&M activities, such as levee repair, trash removal, and biological surveys. These activities would occur intermittently over the lifetime of the project. The O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to existing operational activities. Therefore, potential impacts from long-term operational GHG emissions would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). Operations under the Ravenswood Action Alternatives would include many of those described for Alternative Ravenswood A, though the extent and frequency of necessary levee maintenance could be lessened somewhat. In addition to the operations under Alternative Ravenswood A, the management activities under Alternatives Ravenswood B, C, and D would include operating water control structures to maintain water levels and quality in the enhanced managed ponds (under Alternative Ravenswood B), simulate an intertidal mud flat (under Alternative Ravenswood C), or divert peak stormwater flows from the Bayfront

Canal (under Alternative Ravenswood D). Although all of these are qualitatively different functions, none of them would result in substantially different GHG emissions compared to existing O&M activities or to each other. Alternative Ravenswood B would also include a new interpretive platform, which may result in increased recreational visits. Alternative Ravenswood C would also include new trails and additional viewing or interpretive platforms, which may result in increased recreational visits relative to Alternative Ravenswood B. Alternative Ravenswood D would also include more trails and interpretive features than Alternative Ravenswood C, which may result in increased recreational visits. Overall, however, the adjacent Bedwell Bayfront Park and Bay Trail segments are already recreational areas that receive very high use by recreational visitors. The relatively minor improvements and additional trails and viewpoints are expected to cause minor increases in visitation relative to the baseline. These projected increases are presented in Section 3.6, Recreation, and its technical appendix. Additional emissions from these increases in visitation would not result in a substantial increase in GHG emissions compared to existing operational activities.

The project would be expected to increase carbon sequestration at the pond cluster over the lifetime of the project. Using natural wetlands' carbon sequestration rates (Callaway et al. 2012) and VCS's Methodology for Tidal Wetland and Seagrass Restoration (Silverstrum and Crooks 2013), successful tidal marsh establishment at the Ravenswood Ponds would result in over 295 acres of vegetation that could sequester approximately 104 tons of carbon per year.

For these reasons, potential impacts from long-term operational GHG emissions would be less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Phase 2 Impact 3.17-3: Conflicts with Applicable GHG Emissions Reduction Plan, Policy, or Regulation

Alviso-Island Ponds

Alternative Island A (No Action). As discussed in Impacts 3.17-1 and 3.17-2, Alternative Island A (No Action) would not generate construction GHG emissions and would not result in a substantial net increase in operational GHG emissions. The alternative would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternatives Island B and Island C (Action Alternatives). As discussed in Impacts 3.17-1 and 3.17-2, the Island Action Alternatives would generate construction GHG emissions that are less than significant and would not result in substantial net increases in operational GHG emissions.

As discussed in Section 3.17.2, Regulatory Settings, AB 32 set a statewide target to reduce GHG emissions to 1990 levels by 2020, and the AB 32 Scoping Plan outlines the main strategies that will be used to achieve reductions in GHG emissions in California. These reduction strategies focus on building energy-efficiency programs, expanding California's renewable energy portfolio, implementing the California cap-and-trade program for facilities, establishing targets for transportation-related GHG emissions for California regions, and implementing measures pursuant to existing state laws and policies (including California's clean car standards, goods movement measures, and the Low Carbon Fuel

Standard). These measures are not directly applicable to the project, and as such, the project does not conflict with the AB 32 Scoping Plan.

As discussed in Section 3.17.2, Regulatory Settings, several of the cities in the project area have adopted or drafted CAPs containing GHG emission-reduction policies. It is useful to demonstrate that Phase 2 projects are in alignment with the goals and policies presented in these local CAPs, even though the Phase 2 projects would take place almost entirely on federally owned refuge lands. Applicable policies from these CAPs include reduction of vehicle and equipment idling, use of low-carbon fuels, use of cleaner engines and technology, and reduction or diversion of waste during construction. These are generally similar to and included in the SCC-developed BMPs discussed under Impact 3.17-1, above. The project would implement these BMPs to the extent they are feasible to reduce GHG emissions during construction. The SCC BMPs require the incorporation of low-carbon fuels and alternative fuels in construction equipment and vehicles, use of newer engines in off-road equipment, enforcement of equipment idling limits, electrification of equipment, and reduction of VMT for worker trips and hauling trips through implementation of VMT reduction plans (SCC 2011). These BMPs would be consistent with applicable CAP policies, and the project would therefore not conflict with the CAPs and applicable CAP policies.

The Island Action Alternatives would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Island Action Alternatives Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). As discussed in Impacts 3.17-1 and 3.17-2, Alternative Mountain View A (No Action) would not generate construction GHG emissions and would not result in a substantial net increase in operational GHG emissions. The alternative would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Alternative Mountain View A Level of Significance: Less than Significant

Alternatives Mountain View B and Mountain View C (Action Alternatives). As discussed in Impacts 3.17-1 and 3.17-2, the Mountain View Action Alternatives would generate construction GHG emissions that are less than significant and would not result in substantial net increases in operational GHG emissions.

As discussed in Alternatives Island B and Island C, the project would not conflict with the AB 32 Scoping Plan. The project would implement SCC-developed BMPs, as discussed in Impact 3.17-1, to the extent they are feasible, and these BMPs would be generally similar to and consistent with applicable CAP policies of surrounding cities (SCC 2011). The alternatives would not conflict with the regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Mountain View Action Alternatives Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). As discussed in Impacts 3.17-1 and 3.17-2, Alternative A8 A (No Action) would not generate construction GHG emissions and would not result in a substantial net increase in operational GHG emissions. The alternative would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. As discussed in Impacts 3.17-1 and 3.17-2, Alternative A8 B would generate construction GHG emissions that are less than significant and would not result in a substantial net increase in operational GHG emissions. As discussed for Alternatives Island B and Island C, the project would not conflict with the AB 32 Scoping Plan. The project would implement SCC-developed BMPs, as discussed in Impact 3.17-1, to the extent they are feasible, and these BMPs would be generally similar to and consistent with the applicable CAP policies of surrounding cities (SCC 2011). The alternative would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). As discussed in Impacts 3.17-1 and 3.17-2, Alternative Ravenswood A (No Action) would not generate construction GHG emissions and would not result in a substantial net increase in operational GHG emissions. The alternative would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternatives Ravenswood B, Ravenswood C, and Ravenswood D (Action Alternatives). As discussed in Phase 2 Impacts 3.17-1 and 3.17-2, the Ravenswood Action Alternatives would generate construction GHG emissions that are less than significant and would not result in substantial net increases in operational GHG emissions.

As discussed for Alternatives Island B and Island C, the project would not conflict with the AB 32 Scoping Plan. The project would implement SCC-developed BMPs, as discussed in Impact 3.17-1, to the extent they are feasible, and these BMPs would be generally similar to and consistent with applicable CAP policies of surrounding cities (SCC 2011). The alternatives would not conflict with regulations or applicable CAP policies designed to reduce GHG emissions. Impacts would be less than significant.

Ravenswood Action Alternatives Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.17-5. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features, the AMP and other Refuge management practices and documents. The GHG analysis required no project-level mitigation measures to reduce the impacts to a level that is less than significant.

Table 3.17-5 Phase 2 Summary of Impacts – Greenhouse Gas Emissions

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.17-1: Construction-generated GHG emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS
Phase 2 Impact 3.17-2: Operational GHG emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.17-3: Conflicts with applicable GHG emissions reduction plan, policy, or regulation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Note:

Alternative A at each pond cluster is the No Action Alternative (No Project Alternative under CEQA).

LTS = Less than Significant
NI = No Impact

4. CUMULATIVE IMPACTS

4.1 Introduction

National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations [CFR] 1508.7) define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor collectively significant actions taking place over a period of time." The California Environmental Quality Act (CEQA) provides a similar definition of cumulative impacts. For the purposes of this Final Environmental Impact Statement/Report (Final EIS/R), cumulative effects would be significant if the incremental effect of Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project, though individually limited, is cumulatively considerable when viewed in connection with the effects of past, current, and probable future projects (CEQA Guidelines 15064[h][1]).

This Final EIS/R provides a project-level evaluation and analysis of the SBSP Restoration Project, Phase 2. The 2007 South Bay Salt Pond Restoration Project EIS/R (2007 EIS/R), which was both a Programmatic and a Phase 1-level document, analyzed the larger, program-wide details of the SBSP Restoration Project. Where feasible and appropriate, this Final EIS/R uses information and analysis from the 2007 EIS/R for analysis of the project-level impacts of the SBSP Restoration Project, Phase 2.

The 2007 EIS/R evaluated a program-level No Action Alternative[1] and two program-level Action Alternatives for restoring or enhancing the former salt ponds in the SBSP Restoration Project area. The two Action Alternatives established a set of "bookends" for the long-term project goals. Under these bookends, Programmatic Alternative B would work toward a gradual restoration of 50 percent of the total project acreage being restored to tidal marsh. The other 50 percent would be maintained or enhanced as managed ponds. Programmatic Alternative C would continue past the 50 percent tidal marsh goal and end in 90 percent of the total project area being restored to tidal marsh, leaving only 10 percent as enhanced managed ponds. Programmatic Alternative A is the alternative under which no actions would have been taken (the No Action Alternative).

The 2007 EIS/R evaluated the environmental impacts of these programmatic alternatives and found that Programmatic Alternative A would not meet the project purpose and need of restoring tidal marshes in South San Francisco Bay. The 2007 EIS/R selected Programmatic Alternative C, because the SBSP Restoration Project would need many years and multiple project-level phases to even approach the 50 percent tidal marsh goal of Programmatic Alternative B. As that level of tidal marsh restoration was being approached, the Project Management Team (PMT) and other stakeholders would use the findings of the Adaptive Management Plan (AMP) and the directed scientific research questions to determine whether to stop at the 50 percent tidal marsh goal or continue progress toward the 90 percent goal or some other percentage between those bookends.

The Phase 2 project alternatives evaluated in this Final EIS/R would advance the program-level goals of both Programmatic Alternatives B and C. Completing Phase 2 would move the larger project closer to the 50 percent tidal marsh/50 percent managed ponds goal of Alternative B, but it would not reach it. Thus,

[1] "No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This Final EIS/R uses No Action throughout.

completing Phase 2 would still allow the project to cease restoration activities at some point between the bookends of Programmatic Alternatives B and C.

4.2 Cumulative Setting

The 2007 EIS/R analysis of cumulative impacts was prepared from a list of past, current, and probable future projects that could result in similar impacts and benefits as those of the SBSP Restoration Project. Regional plans were also reviewed to characterize development trends and growth projections in the South Bay over the long-term planning period, which the 2007 EIS/R set at 50 years. These projects are considered in the cumulative impact discussion, together with the SBSP Restoration Project, to determine if the combined effects of all of the projects would be cumulatively considerable and thus would result in significant cumulative impacts. This Final EIS/R expands on that cumulative setting by reviewing additional general and regional plans and considering other reasonably foreseeable projects envisioned since the 2007 EIS/R was adopted.

4.2.1 General and Regional Plans

Plan Bay Area

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. On July 18, 2013, the plan was jointly approved by the Association of Bay Area Governments (ABAG) Executive Board and the Metropolitan Transportation Commission (MTC). The plan includes the region’s Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades.

Plan Bay Area marks the nine-county region’s first long-range plan to meet the requirements of California’s landmark 2008 Senate Bill 375, which calls on each of the state’s 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas (GHG) emissions from cars and light trucks. Working in collaboration with cities and counties, the Plan Bay Area advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy.

San Francisco Bay Plan—San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act (Cal. Govt. Code Sections 66600–66694) is the California state law that established the San Francisco Bay Conservation and Development Commission (BCDC) as a state agency; prescribes BCDC’s powers, responsibilities, and structure; and describes the broad policies BCDC must use to determine whether permits can be issued for activities in and along the shoreline of San Francisco Bay. BCDC’s jurisdiction, regulations, and plans are described in Section 3.5, Biological Resources; Section 3.6, Recreation Resources; and Section 3.16, Visual Resources.

Alameda County General Plan

The Alviso-Island Ponds are within unincorporated Alameda County and are designated as Open Space in the Alameda County General Plan (County of Alameda 1973). The Alameda County General Plan, adopted in 1973, does not include a Land Use Element; instead, it incorporates land use elements from each city’s general plan and each unincorporated area’s specific plan. However, policies applicable to the salt ponds are discussed in the May 4, 1995, Amended Open Space Element. These policies are “Preserve

Natural Ecological Habitats in Shoreline Areas" and "Provide for Orderly Transition of Phased Out Salt Extraction Areas to Uses Compatible with the Open Space Plan."

San Mateo County General Plan

The Ravenswood pond complex is partially within unincorporated San Mateo County and is designated as Open Space in the San Mateo County General Plan. The San Mateo County General Plan was adopted in November 1986. The goals in the plan that are relevant to the salt ponds are discussed in the "Vegetative, Water, Fish and Wildlife Resources Policies" section of the Land Use Element (County of San Mateo 1986) and are described in Section 3.8.2, Regulatory Setting.

Santa Clara County General Plan

The Alviso-Mountain View and Alviso-A8 pond clusters are partially in unincorporated Santa Clara County. The Santa Clara County General Plan 1995–2010 was adopted on December 20, 1994. The vision of this general plan is expressed through a series of goals organized under four basic and equally important themes: Managed, Balanced Growth; Livable Communities; Responsible Resource Conservation; and Social and Economic Well-Being (County of Santa Clara 1994). These goals provide the overall direction for the strategies, policies, and implementing actions of the plan.

Santa Clara Valley Habitat Conservation Plan

The Alviso-Mountain View and Alviso-A8 pond clusters are adjacent to the area covered under the Santa Clara Valley Habitat Conservation Plan (Valley Habitat Plan) (ICF International 2012). This plan provides a framework for promoting the protection and recovery of natural resources, including endangered species, while streamlining the permitting process for planned development, infrastructure, and maintenance activities. In 2013, the Valley Habitat Plan was adopted by all local participating agencies and permits were issued by the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. The Valley Habitat Plan is both a federal Habitat Conservation Plan and a State Natural Community Conservation Plan. The Valley Habitat Plan helps private and public entities plan and implement projects and activities in ways that avoid or minimize and mitigate for impacts on natural resources, including specific threatened and endangered species, identifies regional lands to be preserved or restored to benefit those species, and describes how habitat reserves will be managed and monitored to ensure that they benefit those species. In providing a long-term, coordinated program for habitat restoration and conservation, the Valley Habitat Plan aims to enhance the viability and promote recovery of threatened and endangered species throughout the Santa Clara Valley.

City of Fremont General Plan

The Alviso-Island Ponds are partially within the City of Fremont. The city adopted its General Plan 2030 in December 2011, establishing a new 25-year vision for the community based on technical and legal requirements, extensive discussions with the community, and policymaker input (City of Fremont 2011). That document makes the following statement: "Fremont will serve as a national model of how an auto-oriented suburb can evolve into a sustainable, strategically urban, modern city." The general plan aims for a flourishing downtown; more jobs to match an increasing resident workforce; a variety of housing types; and thriving, pedestrian-oriented commercial districts. The plan addresses the overarching vision of Fremont as a "green" city through goals and policies to meet climate change objectives, reduce solid waste, and enhance the pedestrian and cycling network.

City of Menlo Park General Plan

A portion of the area included in Phase 2 alternatives at the Ravenswood Ponds is within the City of Menlo Park, and the city's Bedwell Bayfront Park would be used for access, construction, and maintenance of Phase 2 projects. The City of Menlo Park General Plan was adopted in 1994, and the Open Space/Conservation, Noise, and Safety Elements were amended in 2013 (City of Menlo Park [1994] 2013). The general plan's purpose is to maintain Menlo Park's special character as a residential community that includes a broad range of residential, business, and employment opportunities and to provide for the change necessary to maintain a vital community.

City of Mountain View 2030 General Plan

Portions of the area included in the Phase 2 alternatives at the Alviso-Mountain View Ponds are within the City of Mountain View, and the city's Shoreline Park would be used for access, construction, and maintenance of Phase 2 projects. The City of Mountain View 2030 General Plan acknowledges that the SBSP Restoration Project "will restore vital habitat around the Bay" (City of Mountain View 2012). No mention of the salt ponds is made within the context of land use, though Goal POS 2.4 encourages access to the Bay and other natural areas, and Goal POS 3 provides for protection of open space areas with natural characteristics (City of Mountain View 2012). Some of the city's natural resources, namely Shoreline Park and two restored brackish marshes, abut the Mountain View Ponds. Policy INC 16.2 encourages management of Shoreline Park to balance the needs of open space, habitat, commercial, and other uses.

City of Redwood City General Plan

The Ravenswood Ponds are not contiguous with Redwood City, but the City of Redwood City's Bayfront Canal and Atherton Channel Project is being considered for inclusion in Alternative Ravenswood D. The City of Redwood City General Plan was adopted in 2010. The city's approach to natural resource conservation includes "preserving, protecting, conserving, re-using, and efficiently using Redwood City's natural resources" (City of Redwood City 2010). Goals relevant to the salt ponds and the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) are discussed in the Natural Resources Element, which reads in part as follows: Goal NR-5: Protect, restore, and maintain creeks, sloughs, and streams to ensure adequate water flow, prevent erosion, provide for viable riparian plant and wildlife habitat and, where appropriate, allow for recreation opportunities; and Goal NR-6: Preserve and enhance the baylands, natural wetlands, and ecosystem to assist with improved air quality and carbon dioxide sequestration.

The Envision San Jose 2040 General Plan

The Alviso-A8 pond cluster is adjacent to the city of San Jose. The Envision San Jose 2040 General Plan sets forth a vision and a comprehensive road map to guide the city's continued growth through the year 2040 (City of San Jose 2007). The plan includes land use policies to shape the transformation of strategically identified and historically underutilized growth areas into higher-density, mixed-use urban districts or "urban villages" that can accommodate employment and housing growth and reduce the environmental impacts of that growth by promoting transit use and walkability. This land use strategy, in combination with progressive economic and environmental policies, will guide the city toward fulfillment of its future vision.

Alviso Master Plan

The former salt-production ponds are specifically referred to in the Alviso Master Plan, which designates uses and policies pertinent to the section of incorporated San Jose immediately adjacent to the Alviso pond complex. The community of Alviso was incorporated into San Jose in 1968. The Alviso Master Plan—adopted in 1998 and addressed in the San Jose 2020 General Plan by way of the Alviso Planned Community (APC)—establishes a long-term development plan for the sensitive Alviso planning area by guiding appropriate new development, community facilities, infrastructure, and beautification (City of San Jose 1998). The majority of land uses allowed by the APC adjacent to the Alviso pond complex are Public Parks and Open Space, and Private Open Space.

4.2.2 Cumulative Projects

Table 4-1 lists recently completed past projects, projects currently under construction, and probable future projects that would overlap with project construction and/or operation and that could impact the same resources. This table provides a brief description of the projects included in the cumulative impact analysis, their locations, their estimated construction schedules, related major roadways and waterways, and the potential cumulative impacts that could occur in combination with those of the proposed project. For future projects, the analysis was based on estimated construction schedules. Where construction schedules were unavailable, it was conservatively assumed that construction periods would overlap with the project, which would be constructed during the dry season over 3 years from 2016 to 2019.

To gather relevant projects, projects and plans for the cities of Fremont, San Jose, Sunnyvale, Mountain View, Palo Alto, East Palo Alto, Redwood City and Menlo Park and county plans for Alameda, Santa Clara, and San Mateo were reviewed. Only those projects or plans far enough along in the development stage to assess their potential contribution to cumulative impacts were included in this analysis. The Santa Clara County Master Plan Trails Element (1977) was not included because it would not add to the cumulative impact analysis. However, future and planned trails from that element are incorporated into the analysis in Section 3.6, Recreation Resources.

4.3 Cumulative Impacts and Mitigation Measures

This section evaluates the potential environmental impacts of the proposed project when considered together with other projects. The analysis addresses only the types of impacts that could occur as a result of project construction and operation, based on the significance criteria provided for each resource discussion in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

The project's potential to adversely contribute to cumulative air quality, greenhouse gas emissions, traffic, noise, and recreation resources impacts would occur primarily during construction. Operational cumulative impacts could occur to biological resources; hydrology, flood management, and infrastructure; water quality and sediment; and public health and vector control.

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Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Ongoing Mosquito Abatement Projects							
Santa Clara County Mosquito Control	Aerial treatment to control for the breeding of salt marsh mosquitoes in the Alviso marshes and other nearby areas.	Santa Clara County, Mountain View Ponds and A8 Ponds	Ongoing	Interstate 880 (I-880), State Route (SR) 237	Guadalupe River, Alviso and Artesian Sloughs	Public health and vector management	No considerable contribution; project is considered in baseline analysis
Alameda County Mosquito Control	The county's mosquito control agency treats tidal pools and salt marshes with a larvacide to reduce mosquito populations.	Alameda County, Island Ponds	Ongoing	I-880	Coyote Creek, Alviso Slough	Public health and vector management	No considerable contribution; project is considered in baseline analysis
San Mateo County Mosquito Control	Technicians inspect marshes throughout the county on a weekly basis. When mosquito larvae are found, they are treated with biorational materials.	San Mateo County, Ravenswood Ponds	Ongoing	U.S. Highway 101 (U.S. 101)	Ravenswood Slough	Public health and vector management	No considerable contribution; project is considered in baseline analysis
Restoration Projects							
San Francisco Estuary Invasive Spartina Project	The Invasive Spartina Project has been implementing a coordinated, region-wide program comprising a number of on-the-ground treatment techniques to eradicate non-native invasive cordgrasses (Spartina alterniflora and its hybrids and S. densiflora, S. patens, and S. anglica). The project is focused within the nearly 40,000 acres of tidal marsh and 29,000 acres of tidal flats that constitute the shoreline areas of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Sacramento Counties.	Bay Area, all ponds	Ongoing	Not applicable (NA)	San Francisco Bay	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; cultural resources	No considerable contribution; project is considered in baseline analysis
Shoreline Study	The study assesses the need for flood protection in the South Bay, extends along South San Francisco Bay and includes the three pond complexes within the SBSP Restoration Project area as well as shoreline and floodplain areas in Alameda, San Mateo, and Santa Clara Counties.	South Bay, all Alviso ponds	Ongoing	I-880, SR 237, U.S. 101	Coyote Creek; Mud, Alviso, and Guadalupe Sloughs	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources	No considerable contribution; project is considered in baseline analysis
Stanford Steelhead Habitat Enhancement Project	Stanford University is proposing to modify its existing water diversion and storage facilities at three locations: Felt Lake Reservoir, the diversion facility on Los Trancos Creek, and the diversion facility on San Francisquito Creek.	City of Palo Alto, Mountain View Ponds	Ongoing	NA	Felt Lake Reservoir, Los Trancos Creek, San Francisquito Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resource; cultural resources	No considerable contribution; project is too far from project area
South Bay Salt Pond Restoration Project – Phase 2 at Eden Landing Ecological Reserve; Future project phases at all three pond complexes	Future SBSP Restoration Project phases at Eden Landing Ecological Reserve and other locations of this long-term, multi-phase project (the subject of this EIS/R) include a mix of tidal marsh and enhanced managed pond restoration activities, increased public access and recreation, and flood protection.	Bay Area, all ponds	Ongoing/ Planned	I-880, SR 237, SR 92, SR 84, U.S. 101	South SF Bay; Alameda County Federal Flood Control Channel; Old Alameda Creek; Coyote Creek; Stevens Creek; Mt. Eden Creek; Mud, Alviso, and Guadalupe Sloughs	Biological resources; hydrology; flood management; recreation resources; water quality	No considerable contribution; project will be implemented using the SBSP Restoration Project's Adaptive Management Plan (as described in the 2007 EIS/R and subsequent documents) to avoid, minimize, and mitigate potential cumulative impacts and contributions to them; project is thus considered in baseline analysis.

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Redwood City Inner Harbor Studies and Plans	The U.S. Army Corps of Engineers (USACE) is studying deepening the Redwood City Harbor.	City of Redwood City, Ravenswood Ponds	Ongoing	U.S. 101	None	Hydrology, flood management, and infrastructure; water quality and sediment; ; biological resources; cultural resources; air quality	Project could contribute to cumulative impacts
San Jose/Santa Clara Water Pollution Control Plant (WPCP) Master Plan	The master plan covers a variety of long-range improvements to the WPCP's facilities and operations over the next 30 years (through 2040). The master plan also covers the phased development of the surrounding lands, including the creation and restoration of habitats and natural corridors to support wildlife, parks, and amenities to foster a greater connection between the community and the coastal environment.	City of San Jose, A8 Ponds	Ongoing	SR 237	San Francisco Bay, Coyote Creek, Guadalupe River	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Final Damage Assessment and Restoration Plan for the November 7, 2007 Cosco Busan Oil Spill	Under the Oil Pollution Act of 1990, the Natural Resource Trustees prepared the Damage Assessment and Restoration Plan/Environmental Assessment (DARP/EA) to assess injuries and evaluate restoration alternatives for natural resources injured by the Cosco Busan Oil Spill. The DARP/EA describes multiple restoration actions to benefit natural resources and compensate for loss of recreation services, including wildlife habitat projects, eelgrass restoration, sandy beach and salt marsh/mudflat habitat restoration, and recreation/human use projects.	San Francisco Bay Area, all ponds	Ongoing	NA	San Francisco Bay Area, all ponds	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Bonde Weir Fish Passage and Channel Stabilization Project	The project includes removing an 11-foot-long by 45-foot-wide concrete sill known as the Bonde weir, re-grading and excavating the creek bed, and installing a roughened channel in its place. The Bonde Weir spans the entire creek width and is a barrier for fish passage under low and high flows. The roughened channel will be engineered to remain relatively stable using a framework of large boulders with a matrix of heterogeneous mix of cobbles, gravel, sand, and silt.	City of Palo Alto, Ravenswood Ponds	Completed	El Camino Real (SR 82)	San Francisquito Creek	Hydrology, flood management, and infrastructure; geology, soils, and seismicity; biological resources; cultural resources	No considerable contribution; project is completed
Bair Island Restoration Project	The project involves import and placement of over 1 million cubic yards of fill to raise the elevations of Outer, Middle, and Inner Bair Islands to create a more natural tidal wetland, observation platforms, a rebuilt trail, and other amenities. Project was completed and new public access features were opened to public in 2015.	City of Redwood City, Ravenswood Ponds	In progress	U.S. 101	Redwood Creek, Corkscrew Slough, Smith Slough, Steinberger Slough	Biological resources, traffic, air quality, greenhouse gas emissions	No considerable contribution; restoration project nearly complete
Kaiser Fish Screen Project	The project involves construction of a new diversion pipeline and cylindrical fish screen to abandon the existing unscreened pipeline. The replacement facility will be constructed about 530 feet downstream of the existing diversion pipe and 2,400 feet upstream of Alameda County Water District's (ACWD's) Rubber Dam 1, where the Union Pacific Railroad (UPRR) and San Francisco Bay Area Rapid Transit District (BART) bridges cross over Alameda Creek.	City of Fremont, Island Ponds	Completed	I-880	Alameda Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; cultural resources	No considerable contribution; project is completed
Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP)	A multi-species HCP/NCCP for most of Santa Clara County, encompassing covered activities that include urban and rural development, in-stream and rural operation and maintenance (O&M) projects, and implementation of a conservation strategy that envisions a reserve system of up to 46,920 acres. The HCP/NCCP provides take authorization for 18 listed and non-listed species (covered species). The former salt ponds and intertidal areas are explicitly excluded from that HCP/NCCP.	Santa Clara County, Island Ponds and A8 Ponds	Ongoing (i.e. approved and being implemented)	NA	All waterways in county	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; cultural resources	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Flood Protection Projects							
Lower Guadalupe River Flood Protection Project	This flood protection project was constructed to prepare the channels to handle stormwater runoff in the event of a 100-year flood, protect endangered species, preserve fish and migratory bird habitat, and allow for open-space recreation. The Santa Clara Valley Water District (SCVWD) installed flood protection improvements along 6.5 miles of the Guadalupe River from the I-880 bridge north to the UPRR bridge in Alviso.	City of San Jose, A8 Ponds	Completed	I-880	Guadalupe River	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; traffic	No considerable contribution; project is completed
Sailing Lake Access Road	Design, permit, and construct drainage and slope stability improvements to the access road to limit seepage and improve the levee's structural capacity.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Sailing lake, Mountain View Slough	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity	Project could contribute to cumulative impacts
Strategy to Advance Flood protection, Ecosystems and Recreation along the Bay (SAFER Bay)	The SAFER Bay project will provide tidal flood protection to communities in East Palo Alto and Menlo Park as well as private businesses, public lands, and facilities of the State of California that are currently in the Federal Emergency Management Area (FEMA) 100-year floodplain, with the objective of integrating measures to protect these communities against tidal surges and the impacts of projected sea-level rise.	Cities of East Palo Alto and Menlo Park, Mountain View Ponds	Planning	U.S. 101	San Francisco Bay, San Francisquito Creek	Water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; air quality; visual resources; greenhouse gas emissions	No considerable contribution; project is considered in baseline analysis
San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Francisco Bay to Highway 101	The project is constructing flood reduction facilities along an approximately 1.5-mile stretch of San Francisquito Creek from East Bayshore Road to San Francisco Bay.	Cities of East Palo Alto, Palo Alto, and Menlo Park; Mountain View Ponds	Ongoing	U.S. 101	San Francisco Bay, San Francisquito Creek	Hydrology, flood management, and infrastructure; biological resources; recreation resources	Project could contribute to cumulative impacts
Sunnyvale East and West Channel Flood Protection Project	The Sunnyvale East and West Channel Flood Protection Project would provide flood protection for residents, businesses, and infrastructure along a 9.5-mile length of the Sunnyvale East and West Channels in the cities of Sunnyvale and Cupertino. The project consists of developing new flood protection infrastructure necessary to provide 100-year riverine flood protection, developing water quality improvements where possible, and making recommendations for recreation improvements.	City of Sunnyvale, A8 Ponds	Ongoing	SR 237	Guadalupe Slough	Water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; air quality; visual resources; greenhouse gas emissions	Project could contribute to cumulative impacts
Santa Clara Valley Water District Stream Maintenance Program	The Santa Clara Valley Water District's Stream Maintenance Program is an ongoing program to address routine maintenance activities in Santa Clara County streams, creeks, and flood control channels. Routine maintenance activities include sediment removal, vegetation management, bank stabilization, minor maintenance, and management of animal conflicts.	Santa Clara County, A8 Ponds	Ongoing	SR 237	Several streams and sloughs in Santa Clara County, including the Guadalupe River, San Tomas Aquino Creek, and others	Water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; air quality; visual resources; greenhouse gas emissions	Project could contribute to cumulative impacts
Charleston Slough and Palo Alto Flood Basin Levee Improvement	Design, permit, and construct improvements to a 6,600-foot section of levee that separates Charleston Slough and the Palo Alto Flood Basin. The levee improvements include raising the crest elevation and providing erosion protection. Because of the shared risk across local government boundaries at the Palo Alto Flood Basin, this aspect of the City of Mountain View's flood exposure is best managed through city participation in a regional planning effort and cost sharing.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Palo Alto Flood Basin, Charleston Slough	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	No considerable contribution; project is considered in baseline analysis
Coast Casey North Levee Improvement	Design, permit, and construct coastal flood levee improvement to help protect property in the City of Mountain View's northwest corner from flooding caused by San Francisco Bay. The levee will extend 1,300 feet from the high ground of the city's Shoreline Park landfill to the city's boundary with Palo Alto.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Coast Casey Forebay	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	No considerable contribution; project is considered in baseline analysis

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Landfill Erosion Protection	Design, permit, and construct erosion protection for the levees on the north side of the East and West Landfill.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Pond A1, Pond A2W	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Lower Permanente Creek Levee and Floodwall Improvements	Design, permit, and construct flood protection measures to protect property along lower Permanente Creek. The measures will consist of raising crest elevations for multiple levee sections, constructing one new floodwall, and raising the crest elevation of three other floodwall sections.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Permanente Creek	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Golf Course Facilities High Ground Augmentation	Design, permit, and construct engineered fill to the north of the City of Mountain View–owned golf course facilities and North Shoreline Boulevard and south of the Mountain View Tidal Marsh to provide flood protection for golf course facilities, including buildings, sanitary sewer lift station, parking lots, and roadway.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	Mountain View Tidal Marsh	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Lower Stevens Creek Levee Improvements	Design, permit, and construct levee improvements along lower Stevens Creek, north of Crittenden Lane. The improvements consist of improvements to existing levees, a short section of new levee with drainage culverts, and levee access and maintenance elements.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Stevens Creek	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Coast Casey Pump Station Improvement	Design and construct a project to improve pump station capacity at the Coast Casey Stormwater Pump Station to counter sea-level rise impacts on pump station hydraulics.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Coast Casey Forebay	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	No considerable contribution; project is considered in baseline analysis
Lower Permanente Creek Storm Drain Improvements	Design and construct the realignment of storm drain systems and the installation of three pump stations to evacuate interior drainage from the storm drains to lower Permanente Creek.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Permanente Creek	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Sailing Lake Intake Pump Station Modification	Design, permit, and implement alterations to the Sailing Lake Pump Station to adapt the pump station, intake, and suction and discharge piping.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Charleston Slough, Pond A1, Sailing Lake	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Charleston Slough Tide Gates Improvement	Revise Inner Charleston Slough tide gate operations to maintain water levels within targeted range.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Charleston Slough	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	No considerable contribution; project is considered in baseline analysis
Safe, Clean Water & Natural Flood Protection Program	The Safe, Clean Water & Natural Flood Protection Program is a 15-year program to help secure the present and future water resources of Santa Clara County. Includes component to bring sediments removed from creeks to maintain flood flow capacity to salt ponds to aid restoration.	Santa Clara County, A8 Ponds	Ongoing	SR 237	San Francisco Bay, Francisquito Creek, Guadalupe River	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; cultural resources	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Bayfront Canal and Atherton Channel Project	The City of Redwood City is partnering with the California State Coastal Conservancy to integrate the Salt Pond Restoration Project with the Bayfront Canal and Atherton Channel Project. The South Bay Salt Pond Restoration Project is the largest tidal wetland restoration project on the West Coast. When complete, the project will restore 15,100 acres of industrial salt ponds to tidal wetlands and other habitats. This integrated project will direct stormwater to Ponds S5 & R5 to enhance the habitat and serve as stormwater detention for the Bayfront Canal and Atherton Channel drainage areas.	City of Redwood City, Ravenswood Ponds	Ongoing	U.S. 101	Bayfront Canal, Atherton Channel, Flood Slough, San Francisco Bay	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Development Projects							
Newby Island Sanitary Landfill	Increase the permitted top elevation of the landfill from 150 to 245 feet mean sea level to allow an increase in the capacity of the landfill by approximately 15.12 million cubic yards, excluding cover materials.	City of San Jose, Island Ponds	Unknown	I-880	Coyote Creek	Biological resources, public health and vector management, air quality	Project could contribute to cumulative impacts
Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay, Fiscal Years 2015–2024	Operation and maintenance dredging to remove sediment to authorized depths to fulfill the USACE's Navigation Mission to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for the movement of commerce, national security needs, and recreation.	San Francisco Bay Area, all ponds	Ongoing	NA	San Francisco Bay	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Zanker Materials Recycling Facility	Allow changes to development and operations on the project site: increase the maximum height of the landfill from 50 to 80 feet; increase the remaining landfill capacity from 62,000 to 700,000 cubic yards; modify the phasing plan of daily waste tonnage accepted; and plan to develop a 200,000-square-foot materials recovery facility on a 52.5-acre site.	City of San Jose, Island Ponds	Ongoing	SR 237 and Los Esteros Road	Guadalupe River	Water quality and sediment, biological resources, cultural resources, public health and vector management, traffic, noise, air quality (and odors), visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
San Jose/Santa Clara Water Pollution Control Plan	The City of San Jose prepared a master plan to address aging infrastructure, reduce odors, accommodate projected population growth in the service area, comply with changing regulations, and develop a comprehensive land use plan for the entire project site.	City of San Jose, A8 Ponds	Ongoing	SR 237	Guadalupe Slough	Water quality and sediment, biological resources, cultural resources, traffic, noise air quality (and odors), greenhouse gas emissions	Project could contribute to cumulative impacts
Palo Alto Municipal Golf Course Reconfiguration Project and the Baylands Athletic Center Expansion Project	The City of Palo Alto plans to begin the renovation and reconfiguration of the existing Palo Alto Municipal Golf Course and expand the Baylands Athletic Center.	City of Palo Alto, Mountain View Ponds	Completed	U.S. 101	San Francisquito Creek, Charleston Slough	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, greenhouse gas emissions	No considerable contribution; project is completed
Facebook Campus Project	Facebook proposes to move its operations to two sites north of U.S. 101 near the intersection of Bayfront Expressway and Willow Road. The project site consists of a 56.9-acre East Campus and a 22-acre West Campus.	City of Menlo Park, Ravenswood Ponds	Completed	SR 84	Ravenswood Slough	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	No considerable contribution; project is completed
Menlo Gateway Project	The development would take place on two sites totaling 15.9 acres near the U.S. 101/Marsh Road interchange. Project would include a cafe/restaurant (4,245 square feet), a health club (68,519 square feet), a hotel (171,563 square feet; 230 rooms), neighborhood-serving retail and community facilities (10,420 square feet), three office and research and development (R&D) buildings (694,669 square feet), and three parking structures.	City of Menlo Park, Ravenswood Ponds	Ongoing	SR 84 and U.S. 101	None	Biological resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Warm Springs South Fremont Community Plan	The plan includes approximately 879 acres around the Warm Springs BART station; about 11.5 million square feet of light industrial, R&D, office, retail, and hotel uses; and 4,000 residential units and an elementary school.	City of Fremont, Island Ponds	Planning	I-880, I-680, Mission Boulevard and Warm Springs Boulevard	None	Traffic, noise, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
San Francisco Public Utilities Commission's (SFPUC) Water System Improvement Project (WSIP)	The SFPUC proposes to adopt and implement WSIP to increase the reliability of the regional water system, which provides drinking water to 2.4 million people in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The WSIP is a program to implement the service goals and system performance objectives established by the SFPUC for the regional water system in the areas of water quality, seismic reliability, delivery reliability, and water supply through the year 2030.	San Francisco Bay, all ponds	Ongoing	NA	San Francisco Bay	Water quality and sediment; geology, soils, and seismicity; utilities	Project could contribute to cumulative impacts
South Bay Advanced Recycled Water Treatment Facility (ARWTF) Project	The ARWTF treats up to 10 million gallons per day of secondary effluent from the San Jose/Santa Clara WPCP with advanced tertiary treatment and blends the high-purity effluent with tertiary effluent from the San Jose/Santa Clara WPCP for use in the South Bay Water Recycling system.	City of San Jose, A8 Ponds	Ongoing	SR 237	San Francisco Bay, Coyote Creek, Guadalupe Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; utilities	Project could contribute to cumulative impacts
2600 Marine Way Office Project	The project is the redevelopment of existing office/light industrial properties with new office uses. The proposed 364,000 square feet of new office space would be an increase of approximately 231,213 square feet over the existing development on the site.	City of Mountain View, Mountain View Ponds	Completed	San Antonio Road	Charleston Slough, Mountain View Slough	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	No considerable contribution; project is completed
Palo Alto Landfill Phase 11C Closure Project	Landfill closure is final land use.	City of Palo Alto, Mountain View Ponds	Completed	U.S. 101	Mayfield Slough	Water quality and sediment, air quality	No considerable contribution; project is completed
North Bayshore Precise Plan	The project is the preparation of a City of Mountain View–initiated Precise Plan and Program Environmental Impact Report for the area identified in the Mountain View 2030 General Plan as the North Bayshore Change Area.	City of Mountain View, Mountain View Ponds	Ongoing	San Antonio Road	Charleston Slough, Mountain View Slough	Recreation resources, traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Cooley Landing Park	The proposed project is the implementation of the Cooley Landing Vision Plan for land in eastern East Palo Alto and Menlo Park.	City of East Palo Alto, and City of Menlo Park Ravenswood Ponds	Ongoing	SR 84	None	Biological resources, recreation	Project could contribute to cumulative impacts
The Preserve at Redwood Shores Precise Plan	The Preserve at Redwood Shores is a 124-acre mixed-use development project, approved by the City of Redwood City that involves site acquisition and the construction of a new elementary school known as Redwood Shores Elementary School on a 7-acre site within the larger parcel. The project includes the construction of a new levee system and realignment of and improvements to the Bay Trail	City of Redwood City, Ravenswood Ponds	Ongoing	U.S. 101	San Francisco Bay, Belmont Slough, Redwood Shores Lagoon, Steinberger Slough	Water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; air quality; visual resources; greenhouse gas emissions	Project could contribute to cumulative impacts
SRI International Campus Modernization Project	SRI International is proposing to modernize its campus with phased development over the next 25 years.	City of Menlo Park, Ravenswood Ponds	Ongoing	U.S. 101	None	Traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Shoreline Athletic Fields, Project 11-33	The Shoreline Athletic Fields Project involves construction of multi-use athletic fields over a closed landfill site, which is now used for storage of equipment and materials; soil stockpiles for maintenance of the landfill, golf course, and park; a storage building for athletic equipment; a children's play area; a burrowing owl foraging area; and parking.	City of Mountain View, Ravenswood Ponds	Completed	U.S. 101	Permanente Creek	Water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources; air quality; visual resources; greenhouse gas emissions	No considerable contribution; project is completed

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Stanford University Medical Center Facilities Renewal and Replacement (SUMC Project)	The SUMC Project involves demolition, replacement, and expansion at the Stanford Hospitals and Clinics, the Lucile Packard Children's Hospital, and the Stanford University School of Medicine.	City of Palo Alto, Ravenswood Ponds	Ongoing	I-280, U.S. 101	San Francisquito Creek	Water quality and sediment, biological resources, recreation resources, cultural resources, visual resources, traffic, noise, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Great America Expansion Project	Project to construct up to 718,000 square feet of new office space in up to three new buildings for a maximum build-out of 1,018,000 square feet of office development, up to two five-level parking structures and surface parking lots with a maximum of 3,360 total parking spaces, potential demolition of an existing 118,000-square-foot office building, and landscaping and site improvements.	City of Sunnyvale, A8 Ponds	Ongoing	Great America Parkway	NA	Traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Moffett Place	The Moffett Place campus project is a proposed development of a 55.394-acre office complex that will consist of six eight-story office buildings, one two-story amenities building, surface parking, and one three-level parking structure, for a total of 1.7 million square feet of total building area. The project's buildings will also surround two large green common spaces to accommodate active and passive recreation on-site.	City of Sunnyvale, A8 Ponds	Ongoing	SR 237	NA	Traffic, air quality, greenhouse gas emissions, recreation resources	Project could contribute to cumulative impacts
Yahoo! Santa Clara Campus	The proposed project is the phased development of a 3,060,000-square-foot office/research and development campus consisting of 13 six-story buildings, three two-story commons buildings, surface parking lots, two-levels of below-grade parking, site circulation, and landscaping following demolition of the existing buildings on the site. The project includes the use of the Hetch Hetchy right-of-way for construction staging and project parking.	City of Sunnyvale, A8 Ponds	Planning	SR 237	Calabasas Creek, San Tomas Aquino Creek, Guadalupe River	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
49ers Stadium Project	The project includes four specific components: Stadium, Substation Relocation, Off-Site Surface Parking, and Parking Garage (Shared Use). The stadium has a permanent seating capacity of up to 68,500 seats and is designed to expand to approximately 75,000 seats for special events.	City of Sunnyvale, A8 Ponds	Completed	SR 237	NA	Traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Google campus expansion	Google expansion onto and throughout the former Moffett Airfield.	City of Mountain View, Mountain View Ponds	Planning	U.S. 101	None	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Creekside Landing Project	The proposed project consists of the development of 524,000 square feet of commercial retail uses (Creekside Landing) and the extension of Fremont Boulevard and the San Francisco Bay Trail from Flood Channel B to Dixon Landing Road.	City of Fremont, Island Ponds	Ongoing	I-880	Coyote Creek	Water quality and sediment, biological resources, recreation resources, cultural resources, traffic, noise, air quality, visual resources, greenhouse gas emissions	Project could contribute to cumulative impacts
Transportation Projects							
Shoreline Boulevard 101 Off-Ramp Modification Feasibility Study	Study alternative configurations of the Highway 101 off- and on-ramps at Shoreline Boulevard to serve as a foundation for a subsequent California Department of Transportation (Caltrans) Project Study Report.	City of Mountain View, Mountain View Ponds	Completed	U.S. 101	None	Traffic, noise, air quality, greenhouse gas emissions	No considerable contribution; project is completed
Transportation 2035 Plan for the San Francisco Bay Area	The proposed Transportation 2035 Plan is the Bay Area's long-range regional transportation plan; it lays out the transportation policies and projects to address the mobility, accessibility, and performance needs of the region through the 2035 planning horizon.	San Francisco Bay Area, all ponds	Ongoing	NA	None	Recreation resources, traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
U.S. 101/Willow Road Interchange Reconstruction Project	The project proposes to reconstruct the U.S. 101/Willow Road (also known as SR 114) Interchange on its existing alignment to a partial cloverleaf interchange.	City of Menlo Park, Ravenswood Ponds	Ongoing	U.S. 101, SR 84	NA	Traffic, air quality, greenhouse gas emissions	Project would contribute to cumulative impacts
Route 101 San Francisquito Creek Bridge Replacement Project	The project proposes to replace the San Francisquito Creek Bridge (Bridge # 35-0013), which is between the University Avenue interchange and the Embarcadero Road interchange on U.S. 101.	City of Palo Alto, Ravenswood Ponds	Ongoing	U.S. 101	San Francisquito Creek	Hydrology, flood management, and infrastructure; recreation resources; traffic, air quality; greenhouse gas emissions	Project could contribute to cumulative impacts
Route 101 Auxiliary Lanes Project, between the Embarcadero Road interchange in the City of Palo Alto and the Marsh Road interchange in the City of Menlo Park.	The project provides auxiliary lanes in both directions by widening U.S. 101 between the Embarcadero Road to the Marsh Road interchange. The proposed project also includes extending the support foundation over the Hetch Hetchy aqueduct, widening the on-ramps, and relocating the existing stormwater lift station adjacent to the Henderson railroad overcrossing.	Cities of Menlo Park, East Palo Alto, and Palo Alto; Ravenswood Ponds	Completed	U.S. 101	NA	Traffic, air quality, greenhouse gas emissions	No considerable contribution; project is completed
U.S. 101 Auxiliary Lanes form State Route 85 to Embarcadero Road	Construct roadway improvements, including auxiliary lanes, and lengthen existing high-occupancy vehicle (HOV) lanes on U.S. 101 in the city of Palo Alto.	Cities of Mountain View and Palo Alto, Ravenswood Ponds	Completed	U.S. 101	NA	Traffic, air quality, greenhouse gas emissions	No considerable contribution; project is completed
Stevens Creek Crossings Project	The project is to create two new two-lane restricted access vehicular bridge crossings extending over Charleston Road and Crittenden Lane, across Stevens Creek, and into the Planetary Ventures leasehold within the Bay View Area of the National Aeronautics and Space Administration (NASA) Ames Research Center, in Mountain View.	City of Mountain View, Ravenswood Ponds	Ongoing (in planning phase)	U.S. 101	Stevens Creek	Traffic; air quality; greenhouse gas emissions; hydrology, flood management, and infrastructure; biological resources; recreation resources	Project could contribute to cumulative impacts
Route 262/Warren Avenue/I-880 Interchange Reconstruction and I-880 Widening	Improve the interchange at SR 84 and Palomares Road, and realign the intersection. Roadway improvements, including bridge replacement and HOV lanes in each direction on a portion of I-880 and SR 262 in and near the cities of Milpitas and Fremont.	City of Fremont, Island Ponds	Ongoing	I-880	Coyote Creek	Traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Los Gatos Creek Bridge Replacement/South Terminal Phase III Project	The proposed project replaces the structurally deficient two-track railroad bridge that crosses Los Gatos Creek and provides a tail track south of San Jose Diridon Station.	City of San Jose, A8 Ponds	Ongoing	San Carlos Street	Los Gatos Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources	Project could contribute to cumulative impacts
Pacific Gas and Electric Company (PG&E) NERC Compliance Efforts	The Federal Energy Regulatory Commission grants the North American Electric Reliability Corporation (NERC) the legal authority to establish and enforce reliability standards for the bulk-power system. PG&E's efforts to comply with NERC have included the upgrading of many of PG&E's overhead transmission systems to meet the requirements of NERC.	San Francisco Bay, all ponds	Ongoing	NA	NA	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; cultural resources; visual resources	Project could contribute to cumulative impacts
Recreation Projects							
Permanente Creek Trail – Amphitheatre Parkway Crossing, Construction	Construct improvements to the existing trail under-crossing at Amphitheatre Parkway.	City of Mountain View, Mountain View Ponds	Ongoing	U.S. 101	Permanente Creek	Recreation resources	Project could contribute to cumulative impacts
San Francisco Bay Area Water Trail Plan	The plan provides recommendations and guidance for a network of landing and launching sites at various locations on the margins of San Francisco Bay and its tributaries. Water Trail access is being considered for at least 112 locations. The plan would also increase use of San Francisco Bay by non-motorized small boats.	San Francisco Bay, all ponds	Ongoing	NA	None	Recreation resources	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION, NEAREST PROJECT POND	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Facebook Campus State Route 84 Overpass Trail	This Facebook-sponsored project would build a pedestrian/bicycle bridge over SR 84 near the Ravenswood pond complex. It would serve the general public in providing a new public access and recreation facility and would also connect two Facebook campuses on either side of the highway.	Ravenswood pond complex	Planning	SR 84	Ravenswood Slough	Recreation resources; Biological Resources (through recreation's disturbance of sensitive wildlife species)	Project could contribute to cumulative impacts on biological resources
Coyote Creek Trail Project: Story Road to Phelan Avenue	Coyote Creek Trail is a multi-use, Class I pedestrian and bicycle trail along Coyote Creek through San Jose. When completed, the trail will extend approximately 30 miles from its northern end at the San Francisco Bay Trail (SR 237 Bikeway) in north San Jose to its southern end near Anderson Lake County Park.	City of San Jose, Island Ponds	Ongoing	SR 237	Coyote Creek	Biological resources, recreation resources, cultural resources, noise	Project could contribute to cumulative impacts

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The analysis of cumulative impacts followed a multi-step approach. First, an evaluation was made as to whether a significant cumulative impact existed within each relevant study area for the impact under consideration. This evaluation was made by reviewing the conclusions of the No Action Alternative in the "Cumulative Impacts" section of the 2007 EIS/R. Then those conclusions were re-examined based on the updated cumulative project information presented in Table 4-1. Next, the Phase 2 project impacts were evaluated as to whether they, in combination with impacts from the other projects, would create a new significant cumulative impact. If so, then a potentially significant impact was found, and mitigation measures from Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, were identified and recommended to reduce this impact to a less-than-significant level. In cases where a significant cumulative impact already exists, even without the SBSP Restoration Project, the Phase 2 project's impacts were examined to determine if they would make a considerable contribution to that impact. If it was determined that the Phase 2 project impacts would not make a considerable contribution to a significant cumulative impact, the impacts were determined to be less than significant.

If a Phase 2 project impact were to have a considerable contribution to a cumulative impact, then mitigation from the project impact analysis in Chapter 3 would be recommended to reduce the project's contribution to cumulative impacts to a level that is less than considerable. However, no considerable contributions to a cumulative impact were found. In contrast to this approach, the 2007 EIS/R determined that if a significant cumulative impact existed even without the project, the project cumulative impact was deemed significant regardless of the project's contribution to that impact.

Hydrology, Flood Management, and Infrastructure

The geographic scope for the cumulative impacts analysis for hydrology, flood management, and related infrastructure encompasses the creeks, sloughs, and other waterways within the project area that feed into South San Francisco Bay. These include Guadalupe River; Coyote and San Francisquito Creeks; and Mud, Alviso, Guadalupe, Ravenswood, and Charleston Sloughs.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with hydrology, flood management, and infrastructure include restoration projects, flood protection projects, and some transportation projects (e.g., bridge replacements). Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant or beneficial cumulative impacts exist in the study area associated with hydrology, flood management, and infrastructure in the project area.

Cumulative Impacts of the No Action Alternatives

No new activities would occur under the Phase 2 No Action Alternatives and the pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current United States Fish and Wildlife Service (USFWS) practices. The existing breached levees would continue to undergo scour from hydraulic action and degrade naturally. Ongoing monitoring and studies to track the progress of these ponds toward tidal marsh restoration would be the principal component of the continued implementation of the AMP.

Under the No Action Alternatives, tidal inundation would cause existing breaches at some of the pond clusters to widen and adjacent levee areas to continue to scour until equilibrium conditions are met. Over a 50-year horizon, tidally restored ponds would be expected to develop into mature salt marsh. Sedimentation would raise pond-bottom elevations above vegetation-colonization elevations, vegetation would establish, and marsh channels would develop within the restored marsh. Mature salt marsh typically exists within the South Bay at an elevation near mean higher high water (MHHW); so bottom elevations are assumed to eventually rise to this level.

Other levees around some of the Phase 2 ponds are high-priority levees to be maintained for habitat management and public access as well as maintain current levels of de facto flood protection. These levees would be maintained (or repaired after unexpected failure) by the Refuge and/or by the Santa Clara Valley Water District or other flood control agencies with a mission and policy to perform those maintenance operations. Because existing levels of flood protection would be maintained and adaptive management would be used to actively monitor and assess flood protection measures, impacts to flood protection under the No Action Alternatives would be less than significant.

Under the No Action Alternatives, existing pond operations and drainage patterns would be maintained. Some ponds would be operated to allow muted tidal exchange. The potential for erosion from water circulating within the ponds and accretion rates within the ponds would be similar to existing conditions because some ponds are not fully tidal and because flows are mediated through tide gates or other engineered water control structures. The Phase 2 SBSP Restoration Project area currently contains few navigable sloughs and waterways—major sloughs have silted in over a period of decades, reducing navigability. At low tide, navigation into or out of shallow sloughs can be problematic. Small craft (e.g., kayaks) are more amenable to the shallow water environments and are more likely to navigate tidal sloughs.

Under the No Action Alternatives, no new improvements to existing levees would occur. Some existing levees would be maintained. Existing breached levees would continue to be scoured from hydraulic action and naturally degrade over time. As such, no additional maintenance (beyond that described above) to repair or improve portions of levees for increased performance during a tsunami and/or seiche would occur under the No Action Alternatives. However, because no habitable structures would be constructed and warning systems would allow for evacuation of the shoreline in such an event, inundation by tsunamis or seiches would not expose people to potential injury or death.

As discussed above, no significant cumulative impacts associated with hydrology, flood management, and infrastructure exist in the project area. The Phase 2 No Action Alternatives would cause less than significant hydrology impacts. Existing levels of flood protection would be maintained and adaptive management would be used to actively monitor and assess flood protection measures. No habitable structures would be constructed and warning systems would allow for evacuation of the shoreline during a tsunami. There would not be a significant cumulative hydrology impact caused by the Phase 2 No Action Alternatives.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives, most pond clusters would be breached to introduce tidal flows, enable (or enhance, in the case of the Island Ponds) sediment accretion, support hydraulic connectivity, alter circulation patterns, and increase habitat complexity. Increases in sediment accumulation and/or sediment distribution in the ponds could help achieve a future flood protection goal of ensuring that the rate of sediment accretion and marsh development keeps pace with expected future sea-level rise.

At those ponds and other waterways already exposed to tidal flows, Phase 2 actions would not change the total volume of water that fills and drains. At those ponds not already exposed to such flows, tides would be introduced through new breaches in most cases and through water control structures at Ponds R5 and S5 at the Ravenswood Ponds. Monitoring and adaptive management would be used at all areas to verify that the Phase 2 actions are performing as intended and to modify or correct those that aren't. Changes to coastal and fluvial flood risk would be minimal for the above-mentioned reasons, and therefore the impacts would be less than significant.

At the Island Ponds, although sediment distribution within the ponds would change due to the breaches, total sediment demand from the ponds would not increase. There would be no change to sediment demand at the A8 Ponds. At the Mountain View Ponds and the Ravenswood Ponds, sediment accretion would begin after breaching, and some erosion of the adjacent mudflats would be expected.

At the Mountain View Ponds and the Ravenswood Ponds, the Phase 2 designs include several improvements to existing levees and berms to maintain or enhance the levels of flood protection currently provided by the former salt ponds and other flood protection infrastructure. At the Mountain View Ponds, some of these enhancements are beyond those required of the SBSP Restoration Project and would be more extensive to meet the City of Mountain View's goals for sea-level rise planning. At the Ravenswood Ponds, the inclusion of that Redwood City's Bayfront Canal and Atherton Channel Project would help reduce an ongoing fluvial flooding problem.

Habitat transition zones would be constructed in some of the Phase 2 ponds. These habitat transition zones would perform several functions: adding some flood protection, buffering against sea-level rise, and adding transitional wildlife habitat. Because adaptive management would be used to actively monitor and assess flood protection measures and existing levels of flood protection would be maintained, impacts to flood protection would be less than significant.

Under the Phase 2 Action Alternatives, drainage patterns within some ponds would change because they would be breached. Sediment would accrete, and marsh channels in portions of the ponds would develop, increasing habitat complexity. The new breaches and the marsh channels would be affected by tidal scour. Levee breaches would increase tidal flows in the sloughs downstream of the breaches, widening and deepening the sloughs over time. Slough width and depths upstream of the breaches would be less affected by levee breaching.

The long-term regional sediment supply in the far South Bay has been studied by Shellenbarger et al. (2013) for the SBSP Restoration Project area. It is estimated that between 29 and 45 million cubic meters of sediment would be required to raise all of the SBSP Restoration Project area to mean tidal level. Sediment influx from the South Bay (north of the Dumbarton Bridge) would supply this amount of sediment in about 90 to 600 years.[2] This estimate reflects the long-term regional sediment supply assuming that there is no net loss of mudflats and marshes in the area and that the volume of sediment needed in the ponds does not change due to sea-level rise or construction. However, some of the subsided ponds would be maintained as managed ponds and not restored to tidal action, so the SBSP Restoration Project as a whole, and Phase 2 in particular, would require less sediment than the estimate provided here. Furthermore, to meet the sediment deficit without overly scouring mudflats, restoration is being phased over many decades to match sediment demand with the rate at which sediment naturally enters the far South Bay, and in future project phases ponds may be partially filled with clean dredged sediments and/or upland material to reduce their demand.

The Phase 2 Action Alternatives would not result in significant adverse impacts to navigation. Over a period of years, some sloughs are expected to scour, increasing channel dimensions. Larger channel cross-

[2] These data are based on using water year 2009 and 2010 sediment budget results. Also, Programmatic Alternative C, analyzed in the 2007 EIS/R, had an upper range of 90 percent tidal restoration, not 100 percent tidal restoration.

sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term.

The Phase 2 Action Alternatives would not include construction of habitable structures. Also, existing warning systems (e.g., the National Weather Service) would allow for evacuation of the shoreline during a tsunami or seiche, so inundation by tsunamis or seiches would not expose people to potential injury or death.

As discussed above, no significant cumulative impacts associated with hydrology, flood management, and infrastructure exist in the project area. The Phase 2 Action Alternatives would cause less than significant hydrology impacts. Changes to coastal and fluvial flood risk would be minimal and existing levels of flood protection would be maintained. Minor tidal scour and mudflat erosion could occur from breaching of levees but these effects would be monitored through the AMP and corrective actions would be implemented if performance metrics are not met. The magnitude of the impacts is so small relative to the background dynamics in the existing environment that there would not be a significant cumulative hydrology impact caused by the Phase 2 Action Alternatives.

Water Quality

The former salt ponds are at the interface between the urban environment and San Francisco Bay (Bay). The geographic scope for water quality cumulative impacts includes the South Bay itself, the SBSP Restoration Project pond complexes, and the lower, adjacent portions of upland watershed areas.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with water quality include restoration projects, flood protection projects, and development projects. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that potentially significant cumulative impacts relative to water quality exist in the study region. Restoration of salt ponds to tidal marsh habitat has the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Phytoplankton abundance could increase as a result of biostimulation due to increased light penetration as sediment accretion creates localized areas of low turbidity outside of breached levees. Other cumulative tidal habitat restoration projects have the potential to cause similar impacts. Risk factors that could cause increased algal abundance are biostimulation due to excessive nutrients or increased water transparency. One risk factor that could cause changes in phytoplankton composition is the opening of new breaches between ponds and Bay waters, thereby introducing new or exotic algal species. Another risk factor is the release of substances toxic to algae from urban runoff, herbicide application, and other sources, thereby selecting for species more resistant to toxicants. Project activities (proposed by the SBSP Restoration Project or by the cumulative projects) that are likely to cause one or more of these risk factors would result in a potentially significant impact.

Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of biological oxygen demand (BOD) and/or chemical oxygen demand (COD) into the Bay, because they would involve opening breaches between ponds and the Bay. Without appropriate adaptive management, it is assumed that other cumulative projects would have potentially significant impacts.

Mobilization and transport of mercury-contaminated sediments is a regional issue that is regulated by the Bay Total Maximum daily Load (TMDL) requirement to drive down the inventory of mercury in the actively resuspended sediment layer. The risk factors for mobilization and transport of mercury-contaminated sediments would come from projects that would involve substantial earthmoving and dredging activities or that would enhance tidal scour and that are near known or suspected sources of mercury-contaminated sediments. Some of the cumulative projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined adaptive management plans and therefore have potentially significant impacts. On balance, the cumulative impacts of other cumulative projects would be potentially significant.

Some cumulative projects would result in a potential increase in net methylmercury production and bioaccumulation and were deemed to have potentially significant impacts because they do not include an adaptive management plan, or the monitoring tools and adaptive management actions for those projects have not yet been defined. For the purposes of this analysis, it is assumed that the other cumulative projects would have potentially significant impacts.

Because it is not known whether other cumulative projects would implement policies and regulations that are required, and there is uncertainty about the scope and timing of regulations to manage particle-associated contaminants such as polychlorinated biphenyls (PCBs) and legacy pesticides, it is assumed that other cumulative projects would result in potentially significant water quality impacts from other contaminants.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives, existing breaches or other connections to the Bay would continue to allow tidal inundation or muted tidal exchange at some of the ponds. Tidal flows would bring slough water through the openings, near which suspended sediments would settle out from the water prior to ebb flows. Accretion in the ponds would decrease suspended sediment supply in the surrounding sloughs and the open waters of the Bay, potentially resulting in increased light penetration and algal abundance outside of the ponds. At the Phase 2 ponds that currently have little or no hydraulic connection to the Bay, the ponds would persist as the seasonal ponds (Ravenswood Ponds) or deep-water ponds (Mountain View Ponds) they are now. In all of these cases, adaptive management would be used to address adverse changes in algal species abundance and composition. If triggers are exceeded as a result of high risk factors, then adaptive management actions would be implemented to convert high-risk factors to low-risk factors. Because of monitoring and implementation of adaptive management measures, all of these potential impacts would be less than significant.

At the Island Ponds, tidal flows would also bring Bay water through existing breaches, near which suspended sediments would settle out from the water prior to ebb flows. Fully tidal systems have relatively high reaeration rates because filling and draining of the ponds causes increased mixing and higher flow rates to the ponds and downstream sloughs, and because ponds are subject to wind mixing. Therefore, the risk of poor dissolved oxygen levels in currently breached ponds would be low, and impacts would be less than significant. Some ponds (the Mountain View Ponds and the A8 Ponds) would continue to be operated with limited directional circulation. Maintaining adequate dissolved oxygen levels in some of these ponds has been the major water quality challenge. Adaptive management practices have been implemented to address issues with low dissolved oxygen levels. The ponds are now operated to maximize flow-through and reduce stagnant areas in the back portions of the ponds. Under the No Action Alternatives, similar adaptive management measures would be implemented during low dissolved oxygen conditions (e.g., changing residence times and/or water depths).

Sediment mercury concentrations in the ponds are expected to be similar to concentrations found in suspended sediments in the lower South Bay. Long-term mercury concentrations in the sediment of the lower South Bay are greater than the target concentration of 0.2 milligram per kilogram (mg/kg), but similar to other areas of the Bay. Managed ponds could have higher rates of net methylmercury production than fully tidal systems. The large pool of easily degraded organic matter in managed ponds (from algal production) could lead to higher methylmercury concentrations in sediment, water, and biota. Labile organic matter fuels the bacteria that methylate inorganic mercury. Ponds that experience very high rates of primary production would likely benefit (in terms of lowering current methylmercury concentrations) from tidal flushing (Grenier et al. 2010). Ponds in some complexes have elevated mercury concentrations in sediments due to deposition of mercury-laden sediments from the Guadalupe River watershed. Adaptive management would continue to be used to monitor effects from managed ponds. Adaptive management monitoring could include methylmercury concentrations in water and sediments and special studies of methylmercury production, degradation, transport, and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when the mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented.

Although construction activities would not occur under the No Action Alternatives, hazards could result from the routine maintenance activities required for managed ponds, which may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. Project proponents would implement control measures specified in the project’s waste discharge requirements (Regional Water Quality Control Board (Region 2) Order No. R2-2008-0078, as revised by R2-2012-0014, or current version). Provisions include specifications for repair, replacement, and servicing of existing facilities; dredging and placement of dredge and/or imported fill material on existing levees; placement of riprap; and general maintenance activities. Implementations of control measures for O&M activities would ensure that impacts would be less than significant.

There are potentially significant cumulative impacts relative to water quality in the study region. Other cumulative tidal habitat restoration projects have the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of biological oxygen demand (BOD) and/or chemical oxygen demand (COD) into the Bay. Some of the cumulative projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined adaptive management plans and therefore have potentially significant impacts. However, the contribution of the Phase 2 No Action Alternatives to these cumulative impacts would not be considerable. As discussed above, all impacts to water quality from the Phase 2 No Action Alternatives are less than significant. Adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Adaptive management measures (e.g., changing residence times and/or water depths) also would be implemented to reduce the potential for the adverse conditions associated with low dissolved oxygen levels and substantial methylmercury levels. Because adaptive management measures would be implemented for all Phase 2 No Action Alternatives, their contribution to a significant cumulative water quality impact would not be considerable relative to the existing environment.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives, some pond levees would be lowered or removed and others would be breached. Areas near the new levee breaches would have increased accretion. Fully tidal systems (both tidal ponds and sloughs) have relatively short retention times, are well mixed by tidal flows, and are often subject to wind and wave action. In general, Phase 2 actions would increase both the amount and the spatial distribution of tidal mixing, and in no cases would these actions reduce this mixing. Therefore, risk factors are low and potential changes in algal abundance are likely to be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

Some Phase 2 ponds (Ponds R5 and S5 at the Ravenswood Ponds and the A8 Ponds) would not be opened to fully tidal flows but would instead be enhanced as managed ponds with muted tidal flows through water control structures. If not well managed, these ponds could become stagnant and rich in nutrients, and therefore would have higher risk factors for changes to algal abundance. However, water control structures would allow directional circulation and other management activities to minimize adverse effects. Should managed ponds cause adverse changes to algal abundance and composition, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of the managed ponds). Because adaptive management would be used to minimize adverse effects from managed ponds, impacts would be less than significant.

Initial breaching of some ponds may temporarily increase the amount of biological oxygen demand in ebb flows, but tidal currents would also provide mixing, improve reaeration, and dilute nutrients, and the shallow water environment would allow dissolved oxygen from surface reaeration to rapidly become vertically well mixed. Some ponds would continue to have very limited tidal mixing and the residence time in the ponds could be on the order of hours to days. If residence times were long, water in the managed ponds would likely be stagnant and rich in nutrients, particularly in summer months, and therefore dissolved oxygen concentrations may be low. Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for the adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, degraded habitat, or unacceptably high methylmercury production rates. Because of monitoring and the implementation of adaptive management measures, impacts would be less than significant.

The increasing tidal flows in some ponds resulting from the breaching levees would allow full tidal inundation to these ponds and increase tidal flows and scour in adjacent sloughs. Although wetting and drying cycles could enhance methylmercury production, the conversion of deep or stagnant ponds to fully tidal marsh would likely lessen the risk of a mercury problem within the pond. The restored tidal marsh would produce less labile organic matter than what is produced in the managed pond, providing less fuel for methylating bacteria and leading to less methylmercury production. There is a potential risk associated with the remobilization of mercury-laden sediment in sloughs downstream of breaches due to scour from the increased tidal prism following reconnection of ponds to full tidal flows. This scour could increase the amount of inorganic mercury that is available for methylmercury production and uptake into the food web, at least in the short term. However, the remobilized sediment would mix with other sediment, be dispersed by the tides, and proceed through various fates of deposition, burial or further transport (Grenier et al. 2010). Adaptive management would be used to monitor effects from tidal marsh restoration and could include methylmercury concentrations in water and sediments and special studies of methylmercury production, degradation, transport, and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when the mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented to avoid significant impacts. Examples of such actions include capping with clean fill, removing mercury-contaminated sediments, or manipulating other factors such as dissolved oxygen concentrations, light penetration, or encouraging development of favorable plant species. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Construction-related activities could lead to short-term, transient adverse water quality impacts during or shortly after the period of construction. Construction activities that could affect water and sediment quality include placement and grading of levee fill, placement of fill material for habitat transition zones, breaching levees, and construction of hardened crossings, all of which could result in short-term increases in turbidity. Construction activities would increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents or equipment malfunction or maintenance. Hazards could also result from the routine maintenance activities required for the ponds and public access facilities; such activities may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen could occur. With proper management and oversight, impacts associated with construction activities should not result in exceedances of any thresholds of significant impact. Also, it is unlikely that the impacts associated with mobilization and transport of contaminated sediment would be of a sufficient magnitude or extent as to cause exceedances of the thresholds identified after mitigation. Programmatic mitigation measure **SBSP Mitigation Measure 3.3-4a: Storm Water Pollution Prevention Plan** would be implemented to further reduce this impact to less than significant.

There are potentially significant cumulative impacts relative to water quality in the study region. Other cumulative tidal habitat restoration projects have the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of biological oxygen demand (BOD) and/or chemical oxygen demand (COD) into the Bay. Some of the cumulative projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined adaptive management plans and therefore have potentially significant impacts. As discussed above, all impacts to water quality from the Phase 2 Action Alternatives are less than significant. Many of the Phase 2 Action Alternatives would actually improve water quality conditions or reduce a water quality problem by increasing tidal flows. Adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Adaptive management measures (e.g., changing residence times and/or water depths) also would be implemented to reduce the potential for the adverse conditions associated with low dissolved oxygen levels and substantial methylmercury levels. Because adaptive management measures would be implemented for all Phase 2 Action Alternatives, their contribution to a significant cumulative water quality impact would not be considerable relative to the existing environment.

Geology, Soils, and Seismicity

The geographic scope of potential cumulative geology, soils, and seismicity impacts is limited to the vicinity of the SBSP Restoration Project. The NEPA- and CEQA-related impacts associated with geological hazards are generally site-specific and depend on localized geologic and soil conditions. As a result, they are not typically additive or cumulative in nature.

Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. Other cumulative flood management projects considered in the 2007 EIS/R and those listed in Table 4-1would be designed to maintain or improve levels of flood protection, and as such would consider local ongoing and future settlement and subsidence from consolidation of bay mud and liquefaction as part of their design and construction. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts are associated with geology, soils, and seismicity in the study region.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives, the existing salt pond levees would be allowed to continue to degrade, and no new structures or weight would be added that could expedite any already occurring rates of subsidence or increase the risks associated with liquefaction or fault rupture. Therefore, implementation of the No Action Alternatives at any of the Phase 2 pond clusters would not increase the risk of any of these hazards. This impact would be less than significant.

No significant cumulative impacts associated with geology, soils, and seismicity exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related geology, soils, and seismicity would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives, raising or improving levees, building habitat islands, or constructing habitat transition zones would add additional weight to some areas underlain by bay mud, thereby potentially increasing the existing rate of settlement. However, the levees and other improvements would be designed and constructed to compensate for settlement and consolidation that would prevent tidal overtopping and be intended to prevent flooding. Also, the levees and other features would be improved and designed to withstand seismic events to the extent practicable. These features would not be placed so as to create new impacts or worsen existing potential impacts on people or property. The long-term settlement of improved levees and other structures resulting from increased weight would be offset by required maintenance to ensure minimum elevations are achieved and potential effects on people and property would be less than significant. The nearby associated infrastructure (roads, railways, bridges, utility access structures, etc.) would continue to be maintained as needed. As such, potential effects from settlement due to consolidation of bay mud would be less than significant.

The Phase 2 Action Alternatives would not cause habitable structures to be constructed within the project areas and would not create new opportunities to expose people to damages resulting from liquefaction, lateral spreading, or fault rupture.

No significant cumulative impacts associated with geology, soils, and seismicity exist in the project area. As discussed above, the Phase 2 Action Alternatives would create less than significant geology impacts. The long-term settlement of improved levees resulting from increased weight would be offset by required maintenance to ensure minimum elevations are achieved. Any failures of upland flood control levees caused by liquefaction or lateral spreading would be repaired similar to what would occur under the management strategy of the AMP. Improved levees would be constructed to withstand failure from fault rupture to the extent practicable. Also, given the site-specific nature of geology impacts under CEQA or NEPA, the Phase 2 Action Alternatives contribution to cumulative impacts would not trigger a significant cumulative impact.

Biological Resources

The geographic scope for the biological resources cumulative impact analysis encompasses areas (including wetlands, intertidal areas, sensitive habitats, and riparian habitats) that could be affected by the proposed project and the projects identified in Table 4-1. This region is appropriate because the habitats and wildlife species that would be affected by the project are part of a broader ecosystem, and the potential disturbance of individual areas has repercussions for a wider region than the immediate project vicinity.

The cumulative impact projects with the greatest potential to affect these are the restoration projects, water treatment plant projects, and the flood protection projects because those projects have the greatest potential to have effects to biological resources. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates potentially significant cumulative impacts relative to biology exist in the study region. Additional tidal restoration efforts that are under way or proposed in San Francisco Bay could reduce the availability of high-tide habitat for small shorebirds to some degree. High-tide roosting habitat is unlikely to limit populations, because pond levees, islands, and other alternative habitats can support high densities of roosting birds. However, conversion of existing ponds to tidal habitats would reduce the numbers of sites where shorebirds can congregate at high tide, potentially resulting in increased predation, crowding effects (possibly including increased susceptibility to disease), and increased disturbance (and associated increases in energy expenditure) by predators and humans. The effects of restoration projects in other parts of the Bay on high-tide foraging habitat are expected to be fairly minor, because the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay.

Tidal wetland restoration projects are expected to influence mudflat habitat acreage and productivity, whereas other cumulative projects are expected to have minimal effect on mudflat habitat acreage or productivity. Approximately 2,500 acres of tidal wetlands have been restored or are planned to be restored in the South Bay in addition to the SBSP Restoration Project. Additional current pond habitat is planned to be opened to the tides and begin accreting sediment to form vegetated tidal salt marsh and other associated tidal wetlands. The sediment demand associated with the cumulative amount of tidal wetland restoration in San Francisco Bay, and the South Bay in particular, in light of sea-level rise would potentially result in a significant loss of mudflat area. Furthermore, some mudflat loss may be offset by increases in mudflat productivity due to marsh restoration and the transport of organic material from restored marshes to mudflats. Therefore, the extent to which mudflat loss would result in a decline in mudflat-associated wildlife species is uncertain. Nevertheless, because of the potential loss of mudflats as a result of sea-level rise and the cumulative tidal wetland restoration projects, a potentially significant cumulative impact could occur. The potential loss of mudflats as a result of cumulative tidal wetland restoration projects and sea-level rise is expected to reduce the area of mudflat foraging habitat for small shorebirds. As a result of this potential mudflat loss, coupled with the conversion of high-tide foraging habitat in managed ponds to tidal habitats, other tidal restoration projects and sea-level rise could potentially result in a significant cumulative impact to small shorebird numbers and the populations of other mudflat-dependent species in the South Bay.

Cumulative Impacts of No Action Alternatives

This section first summarizes the discussions of significance determinations in Section 3.5, Biological Resources, for each of the 25 numbered impacts at the various Phase 2 pond clusters under the No Action Alternatives. The discussion generally follows the order of those numbered impacts. It then discusses whether the Phase 2 No Action Alternatives make a considerable contribution to any existing or newly identified cumulatively significant impacts.

Under the Phase 2 No Action Alternatives, there would either be less-than-significant impacts or no impacts to biological resources, depending on the pond clusters and impacts in question. Under the No Action Alternatives, no new construction activities would occur. The USFWS would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Initial Stewardship Plan (ISP) actions. In general, small shorebird habitat would remain relatively unaffected, resulting in less-than-significant impacts to small shorebirds. In the long term, the area of mudflats would decrease for the Alviso-Island Ponds as the ponds become vegetated, though some mudflat habitat would remain along the channels and sloughs. Relative to the existing amounts of mudflat habitat for wildlife species in the South Bay, this change would be less than significant. There would be no change to intertidal mudflat habitat for the other pond complexes and less-than-significant or no impacts to wildlife species in the South Bay.

Several species of small shorebirds (examples of common species include semipalmated plover, western sandpiper, least sandpiper, dunlin, short-billed dowitcher, and long-billed dowitcher) occur in the San Francisco Bay Area, primarily during migration and in winter (roughly July through April). San Francisco Bay is one of the most important stopover and wintering areas on the west coast for these species. Within San Francisco Bay, the majority of these birds are typically found in the South Bay. There are potentially significant cumulative impacts to small shorebirds in the project area. However, the Phase 2 No Action Alternatives cause no impacts to shorebirds except in the Alviso-Island Ponds, where the impact is less than significant. Therefore, the Phase 2 No Action Alternatives would not have a considerable contribution to a cumulative impact.

Western snowy plovers have found suitable habitat conditions in some former salt ponds that are managed as seasonally dry ponds. However, of the Phase 2 pond clusters, only the Ravenswood Ponds presently provide western snowy plover habitat. Under the No Action Alternatives, there would be no change in impacts to western snowy plover habitat at the Ravenswood Ponds or any of the Phase 2 pond clusters. Also, the USFWS Refuge management team is already planning and implementing a number of habitat enhancements and other management techniques to increase western snowy plover populations. These techniques may include treating the nesting substrates (pond bottoms) with shells and other surfaces to increase camouflage and thus nesting success (as is taking place at California Department of Fish and Wildlife–owned and managed Eden Landing), constructing habitat islands to provide isolated nesting areas (as at Eden Landing Ponds E12 and E13 and Refuge Pond SF2), conducting social attraction experiments such as those currently under way at Pond SF2, and harassing predator species such as gulls. Regardless of which No Action Alternative is selected for Phase 2, the Refuge will continue to actively monitor and manage for western snowy plover, adapt and reapply the results of these experiments, and implement the appropriate actions to maintain western snowy plover populations and protect their habitat.

American avocets, black-necked stilts, Forster's terns, and Caspian terns are colonial waterbirds that nest and forage within portions of the SBSP Restoration Project area. These birds nest on islands within ponds and, in the case of stilts and avocets, on salt pond levees; in dry salt panne habitat; in marshes on higher ground around marsh ponds; and in other bayside habitats. There would be small changes in available nesting, roosting, and foraging habitat for pond-associated waterbirds over time under the No Action Alternatives in the Alviso-Island pond cluster. These changes are extremely unlikely to cause the populations of pond-associated waterbirds to decline 10 percent or greater. There would be no changes under the No Action Alternatives at the other Phase 2 pond clusters.

Diving ducks, such as lesser and greater scaup, bufflehead, canvasbacks, and other species, occur in the South Bay primarily during the nonbreeding season. Although no construction activities or actions would be conducted under the No Action Alternatives, there would be changes over time to the baseline foraging habitat of diving ducks at the Alviso-Island Ponds as they transition to tidal marsh. The Alviso-Mountain View Ponds would be maintained in their current condition and would generally continue to provide the same habitat functions as they do now, though Charleston Slough is intended to slowly transition to tidal marsh. Over time, the open water habitat at the Alviso-A8 Ponds would be slowly lost as the ponds accrete sediment and begin to transition to tidal marsh. This transition is expected to take several decades unless there are structural or operational changes to the A8 Ponds. The Ravenswood Ponds do not currently provide forage habitat for diving ducks, so there would be no impacts on this species. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels.

Although small numbers of ruddy ducks breed in the South Bay, this species occurs in the project area primarily during their winter migration. In contrast with most of the diving ducks addressed above, ruddy ducks are diving ducks that, in the South Bay, forage and roost primarily in salt ponds, with relatively few individuals using tidal habitats in the South Bay. Currently, a small number of ruddy ducks use the Island Ponds and adjacent sloughs for foraging. As the ponds transition to tidal marsh under the No Action Alternatives, they would be expected to be used less, though some foraging habitat would still be available within the channels inside the marsh. These changes would not be expected to produce substantial declines in flyway-level populations. The Alviso-Mountain View Ponds would be maintained in their current condition and would continue to provide substantial amounts of suitable ruddy duck foraging habitat. Seasonally muted tidal pond habitat suitable for foraging ruddy ducks occurs at the Alviso-A8 Ponds. Over time, this open water habitat will be lost as the ponds transition to tidal marsh, though this could take several decades to occur. However, open water habitat for ruddy ducks is present elsewhere in the South Bay. Neither substantial declines in flyway-level populations nor a 15 percent reduction in population is expected under the No Action Alternatives.

Dabbling ducks forage in a variety of habitats in the South Bay, including mudflats, shallow subtidal habitats, tidal sloughs and marsh channels, marsh ponds, managed and muted tidal marsh, seasonal wetlands, managed ponds, and water treatment plants. The tidal marshes that would develop in the breached ponds in the Alviso-Island Ponds are expected to provide roosting and foraging habitat for dabbling ducks. This habitat would be a beneficial impact under NEPA. There would be no impacts to dabbling ducks in any of the other Phase 2 pond clusters under the No Action Alternatives.

The California least tern uses levees in the South Bay as post-breeding roosting sites. After breeding (primarily at Central Bay sites), adult California least terns bring their juvenile offspring to the South Bay to forage before migration. The No Action Alternatives would have less-than-significant impacts on the California least tern at the Alviso-A8 Ponds and no impacts at the other pond complexes.

Small losses of pickleweed-dominated tidal marsh at the Alviso-Island Ponds may occur where uncontrolled breaching occurs, due to erosion and scour. Because such breaches would be unintentional, the locations and extent of habitat loss would not be controlled at all, and thus salt marsh harvest mouse and wandering shrew dispersal in any given area may be adversely affected in the short term. However, in the long term, both the marsh formation in the previously breached ponds and any uncontrolled breaching would ultimately result in increases in tidal marsh habitat, a beneficial effect for tidal marsh-associated wildlife. This increase in habitat would offset any minor short-term impacts to pickleweed dominated tidal marsh and the dispersal or habitat of marsh-associated species. No changes would occur to pickleweed-dominated tidal salt marsh at the other Phase 2 pond clusters.

In the South Bay, managed ponds support lower diversity of native fishes than tidal habitats. Conversely, many of the fish recorded in the South Bay use tidal channels and mudflats at high tide, when they are inundated. These tidal habitats are particularly important as nursery habitat for juvenile fish. Based on the location of the Alviso-Island Ponds (between Coyote Creek and Mud Slough, which are known to contain steelhead), these aquatic habitats are expected to be used by steelhead and other estuarine fish species. These ponds are currently transitioning to tidal marsh habitat as a result of activities implemented under the ISP. As a result, diversified estuarine habitat would continue to develop under the No Action Alternatives, offering shelter and foraging habitat for juvenile steelhead and estuarine fish. This habitat would be a beneficial impact under NEPA. There would be no impacts to steelhead or estuarine fish in any of the other Phase 2 pond clusters under the No Action Alternatives.

The piscivorous birds (e.g., pelicans, cormorants, grebes) of the South Bay forage in a variety of habitats and locations where prey fish are available. The low-salinity salt ponds that support fish, tidal sloughs and channels, edges of intertidal mudflats, non-tidal ponds and channels, and artificial lakes provide the highest-quality foraging areas. The shallow ponds in the Alviso-Island Ponds currently provide limited foraging opportunities for piscivorous birds. The ongoing restoration of tidal marsh habitat is expected to increase the abundance of estuarine fish. This increase would be beneficial to piscivorous birds, because it would increase their prey base, which would be a beneficial impact under NEPA. There would be no impacts to piscivorous birds in any of the other Phase 2 pond clusters under the No Action Alternatives.

Pacific harbor seals are currently the only marine mammals that are permanent residents of San Francisco Bay. Harbor seals forage in nearshore marine habitats on a variety of fishes and invertebrates. The No Action Alternatives would have no impacts on harbor seals at any of the pond complexes. Also, under the No Action Alternatives, no increased recreation access would be provided and no new impacts to sensitive species and their habitats would occur from recreation-orientated activities.

Currently, no threatened or endangered plants species are known to occur in the Phase 2 project area. However, a watch list species (CNPS 4.3), dwarf spikerush (*Eleocharis parvula*), was identified on the surrounding levees in the Alviso-Island Ponds area. Because there would be no actions under the No Action Alternatives, there would be no impact to this species. Over time, new habitat may develop for special-status marsh plants, making the impact of the No Action Alternatives less than significant and potentially beneficial.

The potential uncontrolled nature of levee breaching or failure under the No Action Alternatives could lead to locations and timing of tidal restoration that temporarily increase colonizable land in areas where control is difficult due to access. However, in general, non-native Spartina colonization is expected to be controlled by the Invasive Spartina Project in the near term, and any on-going control would be implemented by land management and resource agencies. Monitoring and management of changes in abundance of smooth cordgrass and its hybrids in the SBSP Restoration Project area are described in the AMP. With the AMP, which would be implemented under all alternatives, and in collaboration with the Invasive Spartina Project, non-native Spartina would be monitored and controlled to reduce impacts to a less than significant level.

Large stands of *Lepidium* are present along adjacent Mud Slough and Coyote Creek. During the transition to tidal marsh in the Alviso-Island Ponds, *Lepidium* could become established, particularly along the margins of new channels that develop within the ponds. The AMP, as discussed in the 2007 EIS/R, addresses monitoring and control of *Lepidium* colonization. The implementation of the AMP would reduce this impact to less than significant.

Of the wildlife diseases that could potentially affect species in the South Bay, those affecting birds are of greatest concern because of the ease with which they may be transmitted (due to birds' mobility) and the large numbers of individuals that can potentially be exposed to diseases in flocks or colonies. Avian botulism, the avian disease with the greatest potential to affect large numbers of birds, is caused by a toxin produced by the bacterium *Clostridium botulinum*. Under the No Action Alternatives, levees breached in 2006 at the Alviso-Island Ponds would continue to naturally degrade, and tidally delivered sediment would continue to accrete in these ponds, allowing for a long-term transition to tidal marsh. Future gradual levee erosion and degradation would increase circulation and decrease conditions that are suitable for avian botulism. The developing tidal marshes are not expected to harbor conditions that are conducive to avian botulism due to the tidal exchange that will keep warm pools from establishing. Other pond complexes would maintain the managed low-salinity ponds in their current state. Under the No Action Alternatives, there would be no increase in exposure of wildlife to avian botulism and other diseases.

The epifaunal invertebrate community in the South Bay is dominated by several species of shrimps and crabs. Two native caridean shrimps, the California bay shrimp and the blacktail bay shrimp, are common in tidal sloughs and in the Bay itself. Bay shrimp may utilize tidal sloughs within the marsh as nurseries. Under the No Action Alternatives, bay shrimp are expected to benefit from the increase in tidal habitat that would occur due to the natural transition to tidal marsh habitat at the Island Ponds. Therefore, impacts are less than significant under CEQA and beneficial under NEPA. Low water quality in discharges could potentially adversely affect bay shrimp. Under the No Action Alternatives, there would be no change in the discharges compared to baseline.

Jurisdictional wetlands and non-wetland waters of the United States (WUS) occur at all project ponds (URS 2014). Under the No Action Alternatives at the Island Ponds (and to a lesser extent at the A8 Ponds and in Charleston Slough), there would be a decrease in water habitat and an increase in vegetated marsh habitat over time. These losses of water habitat would be replaced by high-value wetland habitat. At the Mountain View Ponds and the Ravenswood Ponds, there would be no changes in the area of waters or wetlands. Impacts to existing jurisdictional wetlands or waters would be less than significant.

Potentially significant cumulative impacts associated with biological resources are present in the project area. There is a potential loss of mudflats as a result of sea-level rise and the cumulative tidal wetland restoration projects in the project area. As a result of this potential mudflat loss, coupled with the conversion of high-tide foraging habitat in managed ponds to tidal habitats, other tidal restoration projects and sea-level rise could potentially result in a significant cumulative impact to small shorebird numbers and the populations of other mudflat-dependent species in the South Bay. Under the Phase 2 No Action Alternatives small shorebird habitat would remain relatively unaffected. In the long term, the area of mudflats would decrease for the Alviso-Island Ponds as the ponds become vegetated, though some mudflat habitat would remain along the channels and sloughs. Relative to the existing amounts of mudflat habitat for wildlife species in the South Bay, this contribution to a significant cumulative impact would not be considerable relative to the existing environment. As stated above, impacts of the Phase 2 No Action Alternatives to biological resources would either be less than significant, no impact, or beneficial. The less than significant impacts are relatively minor and would not trigger a significant cumulative impact when combined with the impacts of other cumulative projects.

Cumulative Impacts of Phase 2 Action Alternatives

As discussed in Section 3.5, Biological Resources, under the Phase 2 Action Alternatives, there would be less-than-significant impacts or no impacts to biological resources under all of the Phase 2 Action Alternatives.

Under the Phase 2 Action Alternatives, at most of the pond clusters (except at the A8 Ponds, as discussed below), levees would be breached and/or lowered or removed to introduce tidal flows to the former salt production ponds to either begin or improve their transition to tidal marsh habitat. The Action Alternatives also include habitat improvements such as islands, habitat transition zones, and pilot channels. In a few locations, notably along the All-American Canal at the Ravenswood Ponds and at the southwestern end of the Mountain View Ponds, levee raising and other improvements would be made to maintain or improve the existing levels of flood protection. The Phase 2 Action Alternatives habitat enhancements and public access features would include trails and viewing platforms and—at the Mountain View Ponds—a revised water-intake system for Shoreline Park’s sailing lake in Mountain View. At the Ravenswood Ponds, the Phase 2 alternatives include several different configurations of water control structures and other hydraulic connections to surrounding waterways that would allow two small seasonal ponds to become enhanced managed ponds that would provide a different type of managed pond habitat, depending on the Action Alternative selected. The various Action Alternatives present variations in the number, location, and size of these breaches; other levee and pond modifications; habitat enhancements; water control structures; and public access features.

At the A8 Ponds, the only Phase 2 Action Alternative being considered is the import of fill material from off-site, upland excavation projects and its placement into the southern corners of Pond A8S to form habitat transition zone between the pond bottom and the adjacent uplands. There are no public access features, flood control, or other habitat restoration components to this alternative.

All of these Action Alternative changes are discussed in detail in Chapter 2, Alternatives. The expected effects of 25 individually numbered impacts were analyzed for each Action Alternative at each Phase 2 pond cluster and presented in depth in Section 3.5, Biological Resources. To simplify the cumulative impacts analysis, this section describes the significance determination of those impacts in a high-level/overview fashion that is intended to identify the types of changes that could have potential to cause a new cumulative adverse impact or to make a considerable contribution to an existing cumulative impact.

The Phase 2 Action Alternatives were found to have the potential to affect biological resources in a number of ways:

- Habitat conversion or loss;
- Import and placement of material;

- Disturbance from recreational use of public access features;
- Construction-related effects;
- Increased crowding or susceptibility of wildlife species to predation or disease;
- Creating conditions that are suitable for establishment of invasive plant species; or
- Loss of jurisdictional wetlands and waters of the United States.

As Section 3.5, Biological Resources, explains in detail, most of these changes are expected to be beneficial or neutral to most of the specific biological resources or types/categories of them included in the 2007 EIS/R. Program-level avoidance and minimization measures, implementation of the AMP and other standard management practices used by the Refuge, ongoing collaboration with the adjacent city and county agencies (SCVWD; the Cities of Redwood City, Menlo Park, Mountain View, and Palo Alto), and continued implementation of monitoring and control programs such as the Invasive Spartina Project are expected to be effective in reducing impacts to levels that are less than significant, even on a cumulative basis.

Thus, in almost all cases, the potential for cumulative adverse impacts on biological resources is minimal; most of the effects of the SBSP Restoration Project would be beneficial to at least some of these resources. In the cases where small and short-term adverse impacts are expected and planned for—for example, excavating a channel through an existing fringing tidal marsh to connect a pond to the Bay—the long-term benefits are expected to be much greater: the acreage of the restored tidal marsh in the former pond would be several orders of magnitude larger than that lost in the excavated channel. Further, many of the cumulative impact projects listed in Table 4-1 are similarly oriented toward some form of habitat restoration, meaning that many of the cumulative impacts are themselves beneficial when taken in the aggregate.

The exceptions to this general statement were found to be limited to those biological resources that utilize the existing former salt ponds and/or their surrounding levees in their current configuration. Some wildlife species or guilds—most notably, birds that use shallow or deep-water ponds, intertidal mudflats, or dry salt pannes and their surroundings for nesting, roosting, and/or foraging—would see an overall reduction in the quantities of those habitats. However, with the exception of dry salt pannes, these habitat types are not in short supply in the South Bay. As discussed in Section 3.5, Biological Resources, in most cases affected species do not wholly depend on these particular habitats or features, and Section 3.5 concluded that affected species would be able to gradually relocate to other, similar habitats in the vicinity without losses of individuals in high enough numbers to trigger a significance impact. Nevertheless, the Phase 2 Action Alternatives at the Mountain View Ponds do include islands and other habitat enhancements intended to help minimize the adverse effects of restoring tidal flows to those ponds.

Western snowy plover use the dry salt panne habitat currently present at the Ravenswood Ponds for nesting, and they forage in adjacent shallow water areas within salt ponds. This habitat would be reduced by all of the Ravenswood Action Alternatives. In all three of the Action Alternatives, the proposed on-site western snowy plover habitat enhancements were viewed as effective enough to offset these adverse impacts to a less-than-significant level.

Several species of small shorebirds (examples of common species include semipalmated plover, western sandpiper, least sandpiper, dunlin, short-billed dowitcher, and long-billed dowitcher) occur in the San Francisco Bay Area, primarily during migration and in winter (roughly July through April). Restoration of former salt ponds to tidal habitats is expected to increase the availability of intertidal mudflat foraging area at low tide in the short term, as some of the breached ponds would provide intertidal mudflat habitat for some time before accreting enough sediment to become vegetated. However, in the long term, sedimentation patterns of the South Bay are expected to result in a loss of intertidal mudflat.

The Phase 2 Action Alternatives could potentially affect numbers of diving ducks in the South Bay in several ways. By converting ponds that currently provide foraging habitat for diving ducks to tidal habitats or enhanced managed ponds with a different hydrological regime (e.g., intertidal mudflats in Alternative Ravenswood C), the project would result in an overall loss of managed pond habitat. This conversion is expected to adversely affect habitat for bufflehead, which occur in the South Bay primarily in managed ponds and make relatively little use of tidal waters. However, subtidal habitat in sloughs and larger channels within restored ponds would provide foraging habitat for species such as canvasbacks and scaup, potentially offsetting the effects of the loss of managed pond habitat. Because there is so little existing forage habitat for diving ducks now, Phase 2 activities are unlikely to cause a population decline of 20 percent below baseline level or substantially reduce flyway-level populations. Also, open water habitat for diving ducks is present elsewhere in the South Bay.

Although small numbers of ruddy ducks breed in the South Bay, this species occurs in the project area primarily during winter and their migration. Population trends for this species in the San Francisco Bay between 1981 and 2012 show high variability between years. Ruddy duck survey observations between 1981 and 2012 show a stable 20-year average population across the Pacific flyway despite inter-annual variability in the Bay Area that often exceed 50% of the previous year. These yearly shifts in population indicate not only the highly mutable nature of the Bay Area ecosystem but also the resilient nature of the species and its ability to relocate to suitable ponds in response to environmental changes. Though Phase 2 activities, in conjunction with long-term implementation of the Shoreline Study (including Alviso Ponds A9-A19) and Phase 2 at CDFW’s Eden Landing Ecological Reserve (Ponds E1-E7, E1C, E2C, E4C, and E5C) will result in pond habitat loss and conversion, the timeline for implementation is anticipated to provide sufficient time for ruddy duck populations to disperse to other areas of suitable habitat in the South Bay or elsewhere. This species has a documented ability to recover from stochastic events. Also, the relatively slow pace of Phase 2 implementation will allow for ample study and monitoring of yearly population changes and overall population trends, as well as for development and implementation of adaptive management responses. Thus, these changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Compared to the habitat present for ruddy ducks in the South Bay, the changes to habitat would be small and less than significant.

The tidal marshes that develop under the Phase 2 Action Alternatives for Alviso-Island Ponds and Ravenswood Ponds are expected to provide roosting and foraging habitat for dabbling ducks. This habitat would be a beneficial impact under NEPA. There would be less-than-significant impacts or no impacts to dabbling ducks with any of the other Phase 2 Action Alternatives.

Increased recreational access resulting from Phase 2 Action Alternatives may impact sensitive species and their habitats. However, such disturbance would likely be limited to relatively narrow corridors along the edges of the ponds where trails get added or improved. Further, these effects would be monitored and managed, and implementation of the AMP would ensure that impacts do not reach significant levels.

Public access has considerable potential to result in long-term benefits to sensitive species in the South Bay by improving public education concerning the importance of the SBSP Restoration Project and habitat restoration and South Bay conservation in general. With monitoring and implementation of the AMP, impacts of recreation would be less than significant.

The ongoing balancing of SBSP Restoration Project impacts across many locations as part of the AMP allows minor losses or conversions of some area of one type of habitat in one location can be offset with enhancement of that same type of habitat in that same location or elsewhere. Such enhancements would allow smaller areas of habitat to be equally valuable and beneficial to that particular species or other biological resources.

Because of the less-than-significant impacts or the lack of adverse impacts summarized above most types of cumulative impacts were ruled out categorically. The remaining ones are effects to western snowy plover, small shorebirds, and ducks. The effects on these resources were considered in combinations with the expected impacts of the cumulative impact projects listed in Table 4-1. In other cases where potential impacts were identified but concluded to be less than significant, the magnitude of the impacts is so small relative to the background dynamics in the existing environment that there would not be a considerable contribution to any significant cumulative impact that may exist. The impacts of construction-related noise on wildlife species is an example.

Recreation Resources

The geographic scope for cumulative impacts on recreational resources includes the cities and other communities where the proposed project and cumulative projects would be located (the cities of East Palo Alto, Fremont, Hayward, Menlo Park, Mountain View, Palo Alto, Redwood City, San Jose, and Sunnyvale and portions of unincorporated Alameda, San Mateo, and Santa Clara Counties). This geographic scope is appropriate for this analysis because the displacement of recreational uses from one area can result in the increased use of recreational facilities in another.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with recreation resources include restoration projects, flood protection projects, development projects, and recreation projects. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates no significant cumulative impacts associated with the provision of new public access and recreation facilities in the study region. Recreation-related projects (e.g., construction of trails and park facilities) identified in the planned project lists of local jurisdictions and other cumulative restoration and flood control projects would provide new recreation opportunities (both active and passive) through the development of public access, trails, or other recreation features. Also, it is possible that some of these cumulative trail projects would fill the gaps of the regional Bay Trail network. Other cumulative projects (e.g., residential or commercial development projects) may also require the installation of recreational components.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives, no new recreation activities would occur, and no new facilities would be provided. The pond clusters would continue to be monitored and managed through the activities described in the AMP. Existing recreation use would continue to be similar to that under existing conditions and would not change in the long term.

No significant cumulative impacts associated with recreation resources exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to recreation resources would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

In general, the Phase 2 SBSP Restoration Project's Action Alternatives would increase the availability and quality of public access and recreation opportunities in the communities surrounding the alternatives. The Phase 2 Action Alternatives are not expected to cause any significant adverse environmental effects on recreational facilities or to affect long-term recreational use of the study area except for temporary closures of certain parks, parking areas, or trails associated with the actual construction of some of the Phase 2 projects. When considered in conjunction with the projects listed in the 2007 EIS/R and Table 4-1 and the ongoing uses of the study region, the effects of the Phase 2 Action Alternatives on recreational resources are not expected to cause or contribute to cumulative short-term interruptions of recreational use of regional facilities such as the Bay Trail; short-term or long-term losses of recreational opportunities; or short-term or long-term needs for construction of new recreational facilities.

Restoration of the existing ponds to tidal marsh habitat involves activities that would cause changes to the existing trail system. New trail segments would be constructed as part of the Phase 2 project. With these improvements, the contribution of the Phase 2 Action Alternatives to cumulative impacts to recreation is not considerable.

No significant cumulative impacts associated with recreation resources exist in the project area. The Phase 2 Action Alternatives generally provide greater recreational benefits than currently exist or have no impact to recreation resources. Therefore, the Phase 2 Action Alternatives contribution to cumulative impacts would not be considerable and would not trigger a significant cumulative impact.

Cultural Resources

The geographic scope for cultural resources cumulative impacts includes all areas that would be disturbed by the projects identified in the 2007 EIS/R and those listed in Table 4-1. This scope is appropriate because it is large enough to encompass a representative sample of prehistoric and historic populations that once occupied the region.

The cumulative projects that involve ground disturbance or that would generate groundborne vibration could affect cultural resources by uncovering previously undiscovered archaeological or paleontological resources or by damaging historic structures, potentially resulting in additional cumulative impacts on these resources. The past, present, and reasonably foreseeable future actions considered by this cumulative impacts analysis are residential and non-residential development in the cumulative study area that could affect cultural resources.

All of the types of projects listed in Table 4-1 that would cause ground-disturbing activities could contribute to cumulative impacts associated with cultural resources. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts to cultural resources occur in the study region. By law, all projects are required to take appropriate actions in the event of a find of cultural resources, as stated in **SBSP Mitigation Measure 3.8-1** of the SBSP Restoration Project (see Section 3.8, Cultural Resources, of the 2007 EIS/R). These required actions include stopping work, having a qualified archaeologist examine and determine the significance of the find, determining measures for treatment of the cultural resources, and contacting a Native American most likely descendant. Because such measures are required to address the potential for disturbance to cultural resources, the impacts associated with cumulative projects would be less than significant.

The scale and scope of the SBSP Restoration Project area necessarily means that there is a wide range of known and unknown cultural resources that may be disturbed by some aspect of individual restoration activities. Because so many of these resources are probably obscured, they may only be encountered during project-related earthmoving activities. Accidental discoveries made during construction may be unavoidable; however, as emphasized in the National Historic Preservation Act (NHPA), CEQA, and local plans and policies, wherever practicable, preservation of cultural resources is preferred over additional damage and/or data recovery.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives at each pond cluster, the ponds and their surroundings would continue to be monitored and managed through the activities described in the AMP. No new activities would occur and no cultural resources would be adversely affected.

No significant cumulative impacts associated with cultural resources exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to cultural resources would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives at each pond cluster, there is the potential that previously undocumented cultural resources are present below the surface and could be affected by project activities. However, implementation of **SBSP Mitigation Measure 3.8-1** (described in Chapter 2, Alternatives) would reduce project-related impacts to recorded or unrecorded cultural resources to less-than-significant levels.

The Phase 2 Project Action Alternatives would alter the Alviso Salt Pond Historic Landscape by converting the salt pond and levee complex to tidal marsh. **SBSP Mitigation Measure 3.8-2** (described in Chapter 2, Alternatives) would reduce project-related impacts to recorded or unrecorded cultural resources to less-than-significant levels.

No significant cumulative impacts associated with cultural resources exist in the project area. As discussed above, the Phase 2 Action Alternatives would create less than significant impacts to cultural resources since SBSP Mitigation Measure 3.8-1 and SBSP Mitigation Measure 3.8-2 would be implemented as part of the project. Therefore, the contribution of the Phase 2 Action Alternatives to cumulative impacts would not be considerable and would not trigger a significant cumulative impact.

Land Use

The geographic scope for cumulative impacts on land use includes the cities and communities where the proposed project and cumulative projects would be located (the cities of East Palo Alto, Fremont, Menlo Park, Mountain View, Palo Alto, Redwood City, San Jose and Sunnyvale and portions of unincorporated Alameda, San Mateo, and Santa Clara Counties).

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts on land use and planning resources occur in the study region. Most cumulative projects (especially residential, commercial, and industrial development) are required to conform to the designated uses of general plans and the zoning ordinances of affected jurisdictions before approval. These projects include the cumulative projects listed in the 2007 EIS/R and those listed in Table 4-1. Development projects, in particular, must go through the affected jurisdiction's review process to determine conformity with designated uses, and if required, applicants must apply for a land use zoning amendment for the proposed development parcel before obtaining project approval and construction. Some cumulative public projects may not conform to designated land uses or zoning, but proposed uses are typically compatible with surrounding land uses (e.g., water-related projects within residential areas). Because all projects need to either conform to the appropriate land use designations or be compatible with surrounding land uses, cumulative land use impacts associated with other cumulative projects would be less than significant.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives, the pond clusters would continue to be monitored and managed through the activities described in the AMP. No new activities would occur.

No significant cumulative impacts associated with land use exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to land use would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

None of the activities that would occur under the Phase 2 Action Alternatives would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigating an environmental impact. Therefore, the Phase 2 Action Alternatives would not introduce land uses that would be incompatible with surrounding uses.

Because all projects need to either conform to the appropriate land use designations or be compatible with surrounding land uses, no significant cumulative impacts associated with land use exist in the project area. As stated above, all Phase 2 Action Alternatives would have less than significant land use impacts. The contribution of the Phase 2 Action Alternatives to cumulative impacts related to land use would not be considerable and would not trigger a significant cumulative impact.

Public Health and Vector Management

The geographic scope for public health and vector management includes three mosquito abatement districts: the Alameda County Mosquito Abatement District, the Santa Clara County Vector Control District, and the San Mateo County Mosquito and Vector Control District. All three districts use source reduction, source prevention, larvicide programs, fish programs, mosquito monitoring, vectorborne disease monitoring, and other tools to avoid, reduce, and manage mosquito problems. The districts spray larvicide into the salt marshes and other waterways at various times, as needed, and contribute to the cumulative condition for public health vector management.

The ongoing mosquito abatement projects listed in Table 4-1 could contribute to avoiding cumulative impacts associated with public health and vector management. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts regarding public health vector management exist in the study region. In other parts of the Bay, ongoing and proposed tidal restoration projects are expected to reduce the extent and quality of mosquito breeding habitat, thus reducing the need for vector management. Such reductions would result from the conversion of impounded and diked habitats, which often contain standing water with vegetation, to well-drained tidal marshes that are less suitable for use by breeding mosquitoes. Other cumulative projects listed in the 2007 EIS/R and in Table 4-1 (e.g., development and transportation or flood protection projects) are not expected to increase or decrease mosquito populations. Cumulative projects would result in a less-than-significant cumulative impact associated with increases in mosquito populations.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives, the pond clusters would continue to be monitored and managed through the activities described in the AMP. No new activities would occur.

No significant cumulative impacts associated with public health and vector management exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to public health and vector management would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

The Phase 2 Action Alternatives, for the most part, would likely result in an overall decrease in potential mosquito breeding habitat for the salt-marsh-dwelling mosquito species by providing more thorough tidal flushing. However, in some instances, opening ponds to tidal flows could result in an increase in mosquito habitat relative to the existing conditions. Tidal marshes (once they are established) are suitable habitat for some mosquito species, while the currently large salt ponds with vigorous wind action provide minimal habitat. Thus, there could be an increase the potential habitat for some types of salt marsh mosquito species. Also, the planned habitat transition zones could result in an overall increase in potential mosquito breeding habitat if they are not designed, constructed, and maintained so that water does not pool in them and allow mosquito breeding. Mosquito and vector management would continue to follow the general O&M procedures of the abatement districts and the Refuge and use the AMP for vector control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations.

No significant cumulative impacts associated with public health and vector management exist in the project area. For the Phase 2 Action Alternatives mosquito and vector management would continue to follow the general O&M procedures of the abatement districts and the Refuge and use the AMP for vector control minimizing potential increases in mosquito populations. The contribution of the Phase 2 Action Alternatives to cumulative impacts related to public health and vector management would not be considerable and would not trigger a significant cumulative impact.

Socioeconomics and Environmental Justice

The study area for the socioeconomics and environmental justice cumulative impacts analysis includes the cities of Redwood City, Menlo Park, East Palo Alto, Palo Alto, Mountain View, Sunnyvale, Sunnyvale, Santa Clara, San Jose and Fremont and the unincorporated areas of San Mateo, Santa Clara and Alameda counties in the vicinity of the Phase 2 pond clusters.

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding socioeconomics exist in the study area. Cumulative projects would likely have substantial effects on the local economy by increasing the number of residents, jobs, and commerce. For example, the increase in new residential, commercial, and industrial uses could increase the tax base of the affected jurisdictions, which in turn would lead to improved public services (including police, fire, and recreation services). Recreation-related cumulative projects would increase recreation opportunities in the region, which in turn would increase commerce for businesses that cater to recreational users.

The 2007 EIS/R concluded that the extent to which the cumulative projects would disproportionately affect minority and low-income communities (environmental justice) over the 50-year planning period cannot be determined. For example, industrial or utilities projects could be constructed near minority or low-income communities, which would result in a disproportionate land use compatibility effects such as air quality, traffic, and noise impacts. Because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant. Therefore, it is assumed that the other cumulative projects would have a potentially significant cumulative impact on minority and low-income populations.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives at each Phase 2 pond cluster, no new activities would occur as part of the SBSP Restoration Project. The pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Recreation activities would remain similar to those under existing conditions and would not be expected to change business conditions in the long term. Therefore, no impact to area businesses would occur and the communities would remain similar to existing conditions.

No significant cumulative impacts associated with socioeconomics exist in the project area. Since no impact to area businesses would occur and the communities would remain similar to existing conditions, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to socioeconomics would not be considerable and would not trigger a significant cumulative impact.

Although there are potentially significant cumulative impacts relative to environmental justice in the study region (because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant), the Phase 2 No Action Alternatives would have no disproportionate effects on low income or minority populations and would not contribute to Environmental Justice cumulative impacts.

Cumulative Impacts of Phase 2 Action Alternatives

The Phase 2 Action Alternatives propose the construction of a range of new recreational and public access facilities at two of the pond clusters and restoration activities at all four of them. An increase in use of the additional recreational and public access facilities—as well as the currently existing ones—may incrementally increase activity at businesses associated with recreational users. The construction of the Phase 2 Action Alternatives would result in some new recreation facilities. These facilities would primarily be extensions of existing services (e.g., viewing platforms, interpretative stations, and some new trails) and are not expected to substantially increase the recreational uses of the facilities. Business activity at surrounding businesses that cater to these recreational users could expect a slight increase in their business revenues. Further, the planned restoration activities are generally a long-term environmental benefit to surrounding communities in terms of improving water or air quality, maintaining or improving flood protection, and so on.

No significant cumulative socioeconomic impacts exist in the project area. Socioeconomic impacts under the Phase 2 Action Alternatives would generally be beneficial. The contribution of the completed Phase 2 project activities to cumulative impacts regarding socioeconomics would not be considerable and would not trigger a significant cumulative socioeconomic impact.

The Phase 2 Action Alternatives would involve earthmoving activities at each pond complex that may cause short-term construction disturbance impacts (e.g., noise from construction equipment, increase in dust, and truck traffic). These activities would also occur at some distance from residents and be similarly experienced by non-residents in the nearby business parks and on public roads and trails. Users of these facilities are drawn from the general population. Construction activities would be temporary and generally would not occur exclusively in areas where the minority population is a greater percentage than that of the surrounding cities' populations.

There are potentially significant cumulative impacts relative to environmental justice in the study region (because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant). However, the Phase 2 Action Alternatives would have no disproportionate effect on minority or low income communities. Therefore, the contribution of the Phase 2 Action Alternatives to cumulative impacts related to environmental justice would not be considerable.

Traffic

The geographic scope for cumulative traffic impacts includes the South San Francisco Bay Area in the vicinity of Fremont, San Jose, Mountain View, and Menlo Park, within Alameda, Santa Clara, and San Mateo Counties. The transportation network in and around South San Francisco Bay consists of highways, surface streets, bicycle routes, public transit, railways, and air transportation facilities.

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that potentially significant cumulative impacts regarding construction-related traffic exist in the study region. The development of future cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would require construction activities that necessitate the transportation of equipment, machinery, soils, and workers to and from the work sites. Construction-related traffic would be expected to increase on the local and regional transportation network if these projects were to occur simultaneously. Specifically, if all construction-related traffic were to occur during the weekday peak hours, then significant cumulative traffic levels on roadways or intersections could occur, because traffic congestion within the South Bay occurs primarily during the weekday peak hours. Cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). Also, construction-related traffic for the cumulative projects would likely occur throughout the day, rather than concentrate only during the peak hours. However, because the number of construction-related truck trips is not known for the combination of cumulative projects that would be occurring at any given time, potential impacts from other cumulative projects must be assumed to be potentially significant.

The population of the South Bay is expected to increase over the next 25 years. This increase would result in a corresponding increase in long-term traffic volumes. The increase in long-term traffic, particularly during the weekday peak hours, could potentially degrade traffic levels on a roadway or at an intersection.

Projects identified in the MTC Transportation 2030 Plan (2005) are intended to maintain, manage, and improve surface transportation in the Bay Area. Project proponents are typically required to mitigate for adverse operational-traffic effects generated by their projects either by improving traffic facilities (e.g., widening roads, installing signals) or contributing to a regional fund for traffic improvements. Although MTC projects and mitigation measures for individual development projects are expected to address the potential for long-term degradation of traffic levels on roadways and intersections, due to the uncertainty of funding for these projects and the actual implementation of mitigation measures by project proponents, potential operational-traffic-related effects from cumulative projects would be potentially significant.

With the exception of worker vehicles that are primarily passenger cars, construction-related vehicles would involve the use of heavy trucks. These trucks would be required to follow the local jurisdictions' designated haul routes to the extent feasible; these routes consist primarily of larger roads capable of handling heavy loads. The increase in truck trips could increase wear and tear on local and regional roadways. Although major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks, residential streets are not designed with a pavement thickness that can withstand substantial truck traffic volumes. Because the increase in construction-related truck traffic traveling on designated routes and road improvements for the cumulative projects is not known, the impacts on roadways from cumulative construction projects would be potentially significant.

Cumulative Impacts of No Action Alternatives

Because the No Action Alternatives at each of the Phase 2 pond clusters would not involve construction of new facilities or features within the pond complexes, no construction-related traffic would be generated. As such, no increase in wear and tear on the designated haul routes during construction would occur under the No Action Alternatives. Consequently, the No Action Alternatives would not contribute to cumulative impacts.

Operation of the ponds under the No Action Alternatives at each Phase 2 pond cluster would require limited, intermittent vehicular traffic associated with O&M activities over the 50-year planning period; this traffic would constitute a less-than-significant contribution to cumulative impacts.

Although potentially significant cumulative impacts relative to construction traffic exist in the study region, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to traffic would not be considerable.

Cumulative Impacts of Phase 2 Action Alternatives

Implementation of the Phase 2 Action Alternatives would involve several construction activities that generate construction traffic. The construction traffic would be temporary in nature, lasting the duration of the construction phase. Construction activities would generate traffic associated with the transport of materials and equipment at all four pond clusters, and the delivery of fill material for a number of construction seasons, ranging from one season (at the A8 Ponds and some alternatives at the Ravenswood and Mountain View Ponds) to multiple seasons (for more extensive alternatives at the Ravenswood and Mountain View Ponds). Truck trips would be required for the transport of equipment at the beginning and end of each construction season and for worker commuting on a daily basis. As discussed in Section 3.11.3, Environmental Impacts and Mitigation Measures, the trips resulting from the delivery of equipment and workers would not noticeably contribute to local traffic delays, with the exception of Alternative Ravenswood B, which proposes mitigation to reduce project-related traffic delays to a level that the City of Menlo Park does not deem significant.

During construction of the Phase 2 Action Alternatives, construction traffic would be directed to use designated haul routes. The designated access routes are classified as major arterial streets. As such, these roads were designed to withstand substantial truck traffic. If residential streets are part of the designated haul routes, a video record of road conditions would be prepared before the start of construction for the residential streets affected by the project. A similar video of road conditions would be prepared after project construction is completed. An agreement would be entered into before construction that would detail the pre-construction conditions and post-construction requirements of the roadway rehabilitation program.

O&M activities for components of the pond cluster within the Refuge would continue to follow the AMP. These activities would include pond maintenance, levee maintenance, nesting island maintenance, habitat transition zone maintenance, and maintenance of public access and recreational features. Also, PG&E would continue to operate and maintain its infrastructure in and around some of the pond clusters. The increase in traffic volumes associated with routine maintenance and monitoring activities would be minimal relative to the baseline.

Under the Phase 2 Action Alternatives, new facilities would be installed to improve recreation and public access to two of the pond clusters. Operation of the new recreational facilities would be anticipated to result in a minor increase in visitation. However, the increased visitation is not anticipated to result in a substantial increase in vehicle traffic relative to the traffic volumes of the local network. Due to the periodic nature of the O&M traffic, the limited number of trips generated by workers visiting the ponds, and the minimal increase in visitation, the implementation of the Action Alternatives would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area.

There are potentially significant cumulative impacts relative to traffic in the study region. Construction-related traffic would be expected to increase on the local and regional transportation network if the cumulative projects were to occur simultaneously. Trips resulting from the delivery of equipment and workers during construction would not noticeably contribute to local traffic delays, with the exception of Alternative Ravenswood B, which proposes mitigation to reduce project-related traffic delays to a level that the City of Menlo Park does not deem significant. Also, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). There would be very little additional traffic associated with operation of the Phase 2 Action Alternatives. Therefore, the contribution of the Phase 2 Action Alternatives to cumulative impacts related to traffic would not be considerable.

Noise

Noise and vibration impacts are localized such that the geographic area in which cumulative impacts may occur is limited to the vicinity of the proposed project and the areas adjacent to the proposed construction access and haul routes.

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding short-term construction noise exist in the study region. The development of future cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would require construction activities that generate noise. However, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). Also, because project proponents are required to comply with the requirements of the noise regulations of affected jurisdictions, and exemptions are provided specifically for construction noise, the potential noise effects of cumulative projects during construction would be less than significant.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives, no new construction would occur under Phase 2 and the pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices.

No significant cumulative impacts associated with noise exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to noise would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

As described above, other cumulative projects in the vicinity of the project area would generally result in less-than-significant, short-term construction noise cumulative impacts because project proponents are required to comply with the requirements of noise regulations of the affected jurisdictions, and exemptions are provided specifically for construction noise. Implementation of the Phase 2 Action Alternatives would involve noise-generating construction and earthmoving activities as well as noise related to construction traffic. The Phase 2 project has incorporated programmatic mitigation measure **SBSP Mitigation Measure 3.13-1,** which ensures that construction activities shall be limited to the days and hours or noise levels designated for the local jurisdictions where work activities occur. Therefore, construction activities will not occur during noise-sensitive hours. The Phase 2 project has also incorporated programmatic mitigation measure **SBSP Mitigation Measure 3.13-2,** which requires trucks to avoid residential areas for haul routes.

Periodic maintenance of the pond infrastructure would be required following construction under the Phase 2 Action Alternatives. Maintenance would require approximately one maintenance staff person to travel to the pond clusters one or two times a week to perform activities such as predator control, general vegetation control, and vandalism repairs. Also, AMP monitoring activities would occur, which could require additional workers (e.g., staff, scientific researchers) to access the pond clusters. The frequency of visits to the pond clusters to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season, there could be more trips to the site than during the non-breeding season). However, the number of trips to the project site for maintenance is not expected to increase over the baseline number by more than a few trips per week.

No significant cumulative impacts associated with noise exist in the project area. There would be very little additional noise associated with operation of the Phase 2 Action Alternatives. Construction noise would temporary. Noise resulting from the delivery of equipment and workers during construction would not noticeably increase the ambient noise levels in the project area. Noise from construction activities at the pond clusters would not exceed the applicable local noise standards. Also, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). Therefore, the contribution of the Phase 2 Action Alternatives to cumulative impacts related to construction-related noise would not be considerable and would not trigger a significant cumulative noise impact.

Air Quality

The geographic study area for cumulative air quality impacts is the area surrounding the proposed construction activities in the pond clusters and the San Francisco Bay Area Air Basin (SFBAAB) in general. To address cumulative impacts on regional air quality, the Bay Area Air Quality Management District (BAAQMD) has established thresholds of significance for construction-related and operational emissions of criteria pollutants. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the region's existing air quality conditions. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts would be unnecessary.

The simultaneous construction of cumulative projects, including residential, commercial, industrial, restoration, flood control, and recreation projects, would generate air pollutant emissions, and if these project overlap geographically, could create a significant cumulative impact.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives at each pond cluster, no construction activities would occur. Although O&M activities would be ongoing, they would be the same as those that occur now. Further, they are considered part of project operation and not construction. As such, no construction-generated emissions would occur.

Under the No Action Alternatives, operations at each pond cluster would involve no new activities. The pond clusters would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. The level of activity would be the same as the activities occurring under existing conditions and would not result in a change in emissions. O&M activities could require the use of diesel-powered equipment and vehicles that have the potential to generate toxic air contaminant (TAC) emissions. However, the use of this equipment would be limited in extent and occur intermittently and rarely over the multi-decadal lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant. Therefore, potential impacts from long-term operational emissions would be less than significant.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan (BAAQMD 2011). Because operational emissions would be less than significant, the No Project Alternatives would not conflict with the applicable air quality plan.

Potentially significant cumulative impacts relative to air quality exist in the study region. Under the Phase 2 No Action Alternatives the level of activity would be the same as the activities occurring under existing conditions and would not result in a change in emissions. Therefore, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to air quality would not be considerable.

Cumulative Impacts of Phase 2 Action Alternatives

Implementation of the Phase 2 Action Alternatives would involve—depending on the pond cluster and alternative in question—levee breaches; lowering, removal, or improvement of levees; construction of habitat islands and habitat transition zones; installation of water control structures; and construction of public access and recreational facilities. Construction activities would last up to 35 months for the most construction-intensive alternative and 5 weeks for the shortest-duration alternative. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, worker commute activity; and other miscellaneous activities. Of the four different pond clusters in Phase 2, it is unlikely that project implementation would take place at more than one or two of them at one time.

As shown in Tables 3.13-6 through 3.13-13 in Section 3.13, Air Quality, construction-generated daily emissions of reactive organic gases (ROGs), nitrogen oxides (NO_x), respirable particulate matter (PM_{10}) exhaust, and fine particulate matter ($PM_{2.5}$) exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROGs, carbon monoxide (CO), NO_x, and $PM_{2.5}$ would not exceed applicable de minimis thresholds for general conformity. Therefore, construction of the Phase 2 Action Alternatives would conform to the State Implementation Plan (SIP).

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan (BAAQMD 2011). Because construction-generated emissions would not exceed the thresholds of significance for any of the Action Alternatives, none of the Action Alternatives would conflict with the applicable air quality plan.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines (BAAQMD 2011), and therefore the Action Alternatives would not result in significant fugitive dust impacts.

Because the construction activities associated with the Phase 2 Action Alternatives would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, not conflict with the applicable air quality plan, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from the Phase 2 Action Alternatives would be less than significant.

Operations under the Phase 2 Action Alternatives would be similar to existing conditions and would not result in a substantial increase in emissions compared to the existing operational activity. Therefore, the potential impacts from long-term operational emissions would be less than significant for all Phase 2 Action Alternatives.

According to the BAAQMD 2011 Guidelines, projects that would not result in significant impacts may be considered consistent with the applicable air quality plan. Because operational emissions would be less than significant, Phase 2 Action Alternatives would not conflict with the applicable air quality plan.

The BAAQMD's CEQA Guidelines also require evaluation of the project's contribution to cumulative TAC exposure of sensitive receptors in the project vicinity by considering all sources within 1,000 feet of the project site. In accordance with these guidelines, a project would have a cumulatively considerable impact if the total of these local sources plus the contribution from the project exceeds BAAQMD's cumulative risk and hazard thresholds of 100 in a 1 million excess cancer risk, a Hazard Index (chronic and acute non-cancer risks) of 10, or an annual average $PM_{2.5}$ concentration of 0.8 micrograms per cubic meter ($\mu g/m^3$).

Construction of the Phase 2 Action Alternatives would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Sensitive receptors are approximately 1,000 feet southwest of the Ravenswood pond cluster. BAAQMD recommends that a site screening be conducted to determine if the project would result in the receptors being within 1,000 feet of a particulate matter (PM) or TAC source. Construction would occur throughout this pond cluster site, and many construction activities would occur at distances much greater than 1,000 feet from these receptors. A health risk screening analysis was performed to evaluate potential impacts on sensitive receptors from diesel PM emissions from construction activities. The screening assessment indicated that risks from construction activities under the Phase 2 Action Alternatives would not exceed the BAAQMD health risk and hazard thresholds. Therefore, short-term construction activities would not expose sensitive receptors to substantial PM and TAC emissions.

Project design features for the Action Alternatives would include requirements for the preparation of a Health and Safety Plan that would reduce the potential for workers and nearby residents to be exposed to airborne TACs entrained in fugitive dust during construction.

One of the cumulative projects, the Menlo Gateway Project, is just within 1,000 feet of the Phase 2 Action Alternatives at the Ravenswood Ponds and also may also occur simultaneously with construction work at that pond cluster. However, that project is well over 1,000 feet from the Maximally Exposed Individual (MEI) potentially affected by the Phase 2 Action Alternatives. Therefore, the project's contribution to cumulative risk and hazard impacts would not be cumulatively considerable.

The only criteria pollutant emissions associated with operation of the project would result from maintenance traffic and activities and would remain similar to those associated with existing maintenance activities. Therefore, there would not be a substantial increase in operational risk and hazard impacts associated with operation of the project, and the project would not have a cumulatively considerable contribution to the region's existing air quality conditions as a result of project operation. Visits to some of the Phase 2 ponds could increase somewhat following the addition of some new public access and recreation opportunities, but emissions from these visits would be barely noticeable against the background emissions that already exist.

O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project and would not substantially differ from existing O&M activities. As such, the potential increased exposure of sensitive receptors to TAC emissions during operations would not occur.

The use of results from the health risk screening analysis for construction emissions, the preparation of a Health and Safety Plan, and the intermittent nature of operational activities, the impacts to sensitive receptors from the Phase 2 Action Alternatives would be less than significant.

Although there are potentially significant cumulative impacts relative to air quality in the study region, because the Phase 2 Action Alternatives would not conflict with the applicable air quality plan and the potential increased exposure of sensitive receptors to TAC emissions during operations would not occur, the contribution of the Phase 2 Action Alternatives to cumulative impacts related to air quality would not be considerable.

Public Services

The geographic scope for cumulative impacts on public services includes the cities and communities where the proposed project and cumulative projects would be located (the cities of East Palo Alto, Fremont, Menlo Park, Mountain View, Palo Alto, Redwood City, San Jose and Sunnyvale and portions of unincorporated Alameda, San Mateo, and Santa Clara Counties).

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding public services exist in the study region. Development and operation of many cumulative projects, particularly residential, commercial and industrial projects, would increase the demand for fire and police protection services. Municipalities respond to increases in demand for emergency services by expanding their fire and police protection departments to keep with their service ratio goals. As part of this response, municipalities plan to ensure that sufficient services are provided for future growth. Therefore, impacts on fire and police protection services from cumulative projects would be less than significant.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives, the pond clusters and their surroundings would continue to be monitored and managed through the activities described in the AMP and in accordance with current practices. No new public services facilities would be provided under the No Action Alternatives; thus, there would be no substantial increases in visitor use or increased demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them.

No significant cumulative impacts associated with public services exist in the project area, and the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to public services would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives, some ponds would be breached to introduce tidal flows, and other habitat enhancement features would be added. Existing trails on many of the levees would continue to be maintained. Construction of Phase 2 Action Alternatives would result in limited new recreation facilities. These facilities would be primarily an extension of existing services (e.g., viewing platforms and interpretative stations) and would not be expected to substantially increase the need for police and fire protection services in a manner that would require new facilities or additional staff. The proposed recreation facilities would be designed in a manner that would facilitate the movement of emergency service providers in the event of an emergency (e.g., sufficient trail width to accommodate vehicles and provision of entrances). The Phase 2 Action Alternatives would not be expected to increase the need for public services to such an extent that they would cause a reduction in the acceptable response time or outpace natural growth in the region and require construction of new police and fire protection stations.

No significant cumulative impacts associated with public services exist in the project area. The Phase 2 Action Alternatives would not be expected to increase the need for public services to such an extent that they would cause a reduction in the acceptable response time or outpace natural growth in the region and require construction of new police and fire protection stations. The contribution of the Phase 2 Action Alternatives to cumulative impacts related to public services would not be considerable and would not create a significant cumulative impact.

Utilities

The geographic scope for cumulative impacts on utilities includes the cities and communities where the proposed project and cumulative projects would be located (the cities of East Palo Alto, Fremont, Menlo Park, Mountain View, Palo Alto, Redwood City, San Jose, and Sunnyvale and portions of unincorporated Alameda, San Mateo, and Santa Clara Counties).

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with utilities include flood protection projects and development projects. Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates less-than-significant cumulative impacts regarding utilities exist in the study region except for potential effects to storm drains. Tidal inundation of ponds as a result of unplanned levee breaches, along with other tidal habitat restoration projects, could contribute to reduced access to PG&E towers in the baylands at a time when continued population growth in the Bay Area is expected to increase the demand on these facilities. Other types of cumulative projects are not expected to contribute to reduced access to PG&E towers in the baylands. Other tidal wetland restoration projects are in areas containing towers for power transmission or distribution lines and may result in reduced PG&E access. The number of towers in these tidal restoration areas is small compared to the total number of towers in the South Bay and compared to the number of towers PG&E maintains in existing tidal areas. Impacts at restoration locations where the towers can be accessed by road are expected to be negligible. Therefore, cumulative projects would not significantly reduce access to PG&E towers in the South Bay.

Unplanned breaches in other portions of the SBSP Restoration Project area could affect storm drains in the vicinity of those breaches, and storm drain improvements implemented as part of other projects in the area would not offset adverse effects in these areas. These cumulative impacts would therefore be potentially significant.

Other cumulative projects are not expected to result in changes in water level, tidal flow, or sedimentation near pumping facilities and sewer force mains and outfalls.

Other cumulative projects are not expected to disrupt Hetch Hetchy Aqueduct services and are not expected to disrupt rail service.

Cumulative Impacts of No Action Alternatives

Under the Phase 2 No Action Alternatives, no new activities would be implemented as part of Phase 2. The pond clusters would continue to be managed through the activities described in the AMP and in accordance with current USFWS practices. In addition to levee maintenance, PG&E tower improvements would be made as part of routine maintenance, to comply with the requirements of the NERC program, and to adapt to sea-level rise. These improvements may involve raising towers and/or raising and strengthening the foundations or superstructures of towers. Because of the continued maintenance of levees and ponds and improvements planned for the towers under the NERC program, PG&E’s ability to access existing towers via levees and boardwalks would be maintained.

Unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation near storm drain systems, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches are not expected to affect the ability to operate storm drain systems.

Impacts resulting from changes in water level, tidal flow, or sedimentation near pumping facilities would be less than significant. There are no sewer force mains or outfalls in close proximity to any of the Phase 2 pond clusters. Therefore, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

The Phase 2 No Action Alternatives would have no impacts regarding disruption of rail service.

There are potentially significant cumulative impacts relative to changes in water level, tidal flow, and sedimentation near storm drain systems in the study region. Unplanned breaches in other portions of the SBSP Restoration Project area could affect storm drains in the vicinity of those breaches. Under the Phase 2 No Action Alternatives, unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation near storm drain systems, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches are not expected to affect the ability to operate storm drain systems. Therefore, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to storm drain systems would not be considerable.

No significant cumulative impacts associated with other utilities exist in the project area. Under the Phase 2 No Action Alternatives access to PG&E's transmission towers would be maintained. Operation of storm drain systems are not expected to be affected. No sewer force mains or outfalls are in close proximity to any of the Phase 2 pond clusters. Therefore, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to other utilities would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

Under the Phase 2 Action Alternatives, no changes to PG&E towers, storm water management, or other utilities are planned at most of the pond clusters. However, at the Mountain View Ponds, Phase 2 would include raising the concrete foundations of the PG&E towers and raising and improving the maintenance boardwalks to retain access after the ponds are breached. Bridges would be installed across some breaches to maintain the connectivity of the existing PG&E access road on this levee. Some of the habitat transition zones would be constructed around and beneath existing PG&E transmission towers and maintenance boardwalks. The boardwalks would be raised above the high-tide levels. The towers would continue to be maintained by PG&E. Access to the transmission towers outside of pond levees by boat or helicopter would not be impacted.

Other potential impacts to utilities include sedimentation near storm drain systems, pumping facilities, and sewer force mains and outfalls; disruption to Hetch Hetchy Aqueduct service; disruption of rail service; and reduced access to sewer force mains. However, as with the Phase 2 No Action Alternatives, none of the Phase 2 Action Alternatives would directly affect or modify these systems, impair the functioning or operation and maintenance of these systems or their infrastructure, or otherwise adversely affect them.

There are potentially significant cumulative impacts relative to changes in water level, tidal flow, and sedimentation near storm drain systems in the study region. Unplanned breaches in other portions of the

SBSP Restoration Project area could affect storm drains in the vicinity of those breaches. Overall, the expected changes in water levels and sedimentation patterns associated with the Phase 2 Action Alternatives are not expected to substantially affect the operation of storm drain systems or pumping facilities. Therefore the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to storm drain systems would not be considerable.

No significant cumulative impacts associated with other utilities exist in the project area. The Phase 2 Action Alternatives would have no impacts to the other utilities in the project area (i.e., electrical transmission lines, towers, sewer force mains, Hetch Hetchy Aqueduct, or rail). As such, the contribution of the Phase 2 Action Alternatives to cumulative impacts related to utilities would not be considerable and would not create a significant cumulative impact.

Visual Resources

The geographic scope for the visual resources cumulative impact analysis consists of the immediate, publicly viewable area within or surrounding the existing salt ponds.

Review of the 2007 EIS/R and the cumulative projects listed in Table 4-1 indicates potentially significant visual resources cumulative impacts exist within the study region. Cumulative projects (including residential, commercial, industrial, flood control, restoration, and recreation projects) would alter views of the South Bay, including the SBSP Restoration Project area, through construction of new facilities (e.g., buildings, recreational features, levees, floodwalls) or expansion of existing facilities (e.g., expansion of commercial centers). For those cumulative impact projects that would include features that could alter views, these changes would be required to comply with applicable government policies and guidelines related to aesthetic resources pertaining to the location of development, height restrictions, and architectural design. These policies and guidelines are intended to limit development of incongruous visual features and maximize visual integration. Flood protection projects and development projects could construct facilities that would obstruct scenic views. Because it is not known whether the cumulative projects would obstruct views or where facilities obstructing views would be constructed, the potential effects on views cannot be evaluated. Consequently, for this analysis, it is assumed that impacts on views resulting from cumulative projects would be potentially significant.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives, the ponds would continue to be managed through the activities described in the AMP and there would be no alteration of views in the SBSP Restoration Project area.

Although there are potentially significant cumulative impacts relative to visual resources in the study region, the contribution of the Phase 2 No Action Alternatives to cumulative impacts related to visual resources would not be considerable.

Cumulative Impacts of Phase 2 Action Alternatives

Some of the Phase 2 Action Alternatives would open some ponds to tidal flows to restore them to tidal marsh, improve levees to provide additional flood protection, create habitat transition zones and other habitat enhancement features, increase pond connectivity, and add or improve public access features. The major effect of these actions would be the creation of tidal marsh habitat, which would change the visual environment of the Phase 2 pond clusters in various ways. The Alviso-Island Ponds are already open to tidal flows and are transitioning to marshes; the Action Alternatives for the Island Ponds would not change that end condition but would change the spatial distribution and complexity of that marsh. At the Alviso-Mountain View Ponds, the Action Alternatives would change the ponds from deepwater ponds to vegetated marshes, which would alter the texture and color of the views. At the Alviso-A8 Ponds, the Action Alternative would add habitat transition zones, which would introduce a minor visual change of the vegetated slopes into the ponds. At the Ravenswood Ponds, the Action Alternatives would change seasonal ponds to vegetated marshes, which would alter the texture and color of the views.

There are potentially significant cumulative impacts relative to visual resources in the study region. Cumulative projects would alter views of the South Bay, including the SBSP Restoration Project area, through construction of new facilities or expansion of existing. The Phase 2 Action Alternatives would create a less than significant impact to visual resources by altering the texture and color of the views and introducing a minor visual change. Although this represents a change to the visual character, this very minor change to the visual character of the study region as a whole would not be a considerable contribution to the cumulative impact.

Greenhouse Gas Emissions

Because GHG emissions affect global climate change, the evaluation of GHG emissions is inherently a cumulative impact issue. However, it is not feasible to evaluate GHG emissions impacts based on the sum of all past, present, and reasonably foreseeable future projects on a global scale. Therefore, the geographic scopes for cumulative GHG emissions impacts are the SFBAAB and the state of California as a whole.

Cumulative Impacts of No Action Alternatives

Under the No Action Alternatives, no construction activities would occur within the Phase 2 ponds. Although limited O&M activities would be ongoing, they are considered part of baseline operations, not construction. As such, no additional construction-generated GHG emissions would occur. Operations under the No Action Alternatives would involve limited O&M activities, such as levee repair, railroad track maintenance, and biological surveys. These activities would occur intermittently over the 50-year lifetime of the project. O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to the existing operational activity. Therefore, potential impacts from long-term operational GHG emissions under the No Action Alternatives would be less than significant and would not make a considerable contribution to a cumulative impact.

Cumulative Impacts of Phase 2 Action Alternatives

Implementation of the Phase 2 Action Alternatives would involve GHG-emitting activities such as levee improvements, creation of nesting islands, creation of habitat transition zones, and construction of recreational facilities. Up to 730,000 cubic yards of material would be transported from off-site locations, depending on the alternatives selected. The Phase 2 Action Alternatives would generate construction-related GHG emissions from off-road equipment, material hauling, and worker commute activity.

The environmental impacts of GHG emissions are long-term and global in nature. For that reason, unlike any of the other environmental resources or impacts analyzed in this Final EIS/R, it is useful to include an estimate of the maximum GHG emission from the combined actions at the four pond clusters included in Phase 2. Assuming the alternative with the most GHG emissions at the Island Ponds, the A8 Ponds, the Mountain View Ponds, and the Ravenswood Ponds is selected, the sum of the estimated GHG emissions values from Tables 3.17-1 through 3.17-4 (in Section 3.17) can be used to analyze this highest potential emissions scenario. To do this, the construction GHG emissions from the most highly emitting alternatives at each pond cluster were summed and amortized over the 50-year lifetime of the project.

Using those values, the sum of estimated GHG emissions from construction actions under Alternative Island C, Alternative Mountain View C, Alternative A8 B, and Alternative Ravenswood C is 1,688 metric tons of CO_2e. Amortized over the 50-year project lifetime, this sum is 33.76 metric tons of CO_2e per year. This value for amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2e per year, which is the applicable regional significance threshold, and would thus be less than significant.

Further, the restored tidal marshes are projected to be a net absorber of carbon dioxide, the most common GHG, which would reduce the net emissions from the project. Relative to the overall emissions of GHGs in the southern portions of the SFBAAB and in California as a whole, the GHG emissions from Phase 2 Action Alternatives are extremely minor. As a result, this impact would be less than significant and would not make a considerable contribution to a cumulative impact.

5. OTHER NEPA AND CEQA CONSIDERATIONS

This chapter discusses broader considerations and other aspects of regulatory compliance that are required under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Section 15126 of the CEQA Guidelines states that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. This chapter describes any unavoidable, adverse, and potentially significant impacts that implementing Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project would create, describes the relationship between short-term uses of the environment and long-term productivity, and discusses significant irreversible or irretrievable commitments of resources or foreclosures of future options that implementation of the Phase 2 project would create. This chapter also discusses compliance with federal executive orders and acts that may be required by the project but that are not directly included as part of this Final Environmental Impact Statement/Report (referred to throughout as the Final EIS/R). This chapter is generally based on the detailed analysis of environmental resources of concern presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, as well as in the project designs and concepts described in Chapter 2, Alternatives.

5.1 Unavoidable Adverse Potentially Significant Impacts

Chapter 2, Alternatives, explains the efforts the agencies have made through the project development and environmental review process to design the Phase 2 project in a manner that avoids and minimizes impacts. Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, describes the potential environmental consequences of developing the Phase 2 project. The program-level mitigation measures described in Chapter 2 were implemented as part of the project-specific designs, and additional project-level mitigation measures were prescribed for potentially significant adverse impacts that remained following those that were implemented. The impacts that cannot be mitigated to a less-than-significant level are the following:

- Recreation Resources: Alternatives Mountain View B and Mountain View C and Alternatives Ravenswood B, Ravenswood C, and Ravenswood D would have significant and unavoidable impacts from construction activities related to the project resulting in temporary closure of existing trails and recreation facilities. Additionally, Alternatives Mountain View A and Mountain View B and Alternatives Ravenswood A and Ravenswood B would have potentially significant impacts because the alternatives would not be fully consistent with the Bay Conservation and Development Commission policy to provide the *maximum* feasible public access, including some access features that were outlined in the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R).

5.2 Irreversible or Irretrievable Commitment of Resources

Section 15126.2(c) of the CEQA Guidelines states: "Uses of nonrenewable resources during the initial and continued phases of the Project may be irreversible since a large commitment of such resources makes removal or irreversible nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from accidents associated with the Project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."

Implementation of Alternative A (the No Action Alternative[1]) for each pond cluster would result in no irreversible or irretrievable commitment of resources, since no restoration or other activities would occur within the Phase 2 area and only maintenance-related levee improvements would be limited. A limited degree of operations and maintenance (O&M) activities (e.g., levee improvement and replacement of water control structures) would involve some labor as well as energy usage by construction equipment, but this would be considered a relatively minor commitment of resources. Further, implementation of the No Action Alternatives as part of the Phase 2 project would not preclude the possibility of including one or more of the currently proposed actions as part of a future project phase (Phase 3 or later) and thus would be reversible.

Compared to Alternative A, implementation of any of the Action Alternatives (Alternatives Island B or Island C, Alternatives Mountain View B or Mountain View C, Alternative A8 B, and Alternatives Ravenswood B, Ravenswood C, or Ravenswood D) at a particular pond cluster would generally involve a greater short-term use of resources such as fossil fuels and labor, due to the greater degree of energy required to implement the restoration, flood protection and recreation and public access features proposed under these alternatives. However, almost all of these resources would be used during the implementation (i.e., construction) stages of Action Alternatives, rather than on a continual basis over the long term. Over the operations stage of the project, the long-term commitment of resources would not be radically different than the current O&M activities require, and may be less in some cases. Therefore, this commitment of resources would not be considered significant.

5.3 Growth Inducement

Section 15162.2(d) of the CEQA Guidelines requires that an Environmental Impact Report (EIR) address the potential growth-inducing impacts of a proposed project. Specifically, the EIR should "discuss the ways in which a project could foster economic or population growth, or the construction of additional housing either directly or indirectly, in a surrounding environment. Included in this are projects which would remove obstacles to population growth… It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment." Projects that could remove obstacles to population growth must also be considered in this discussion.

Existing and projected total population and households in the three counties and individual cities where the Phase 2 area is located are shown in Tables 3.10-1 and 3.10-2 in Section 3.10, Socioeconomics and Environmental Justice. The Phase 2 project does not propose construction of any housing, directly or indirectly, in the South San Francisco Bay.

Because no restoration activities and only limited O&M activities (e.g., levee improvements, replacement of water control structures) would occur under Alternatives A, no economic, population, or housing growth would result from implementation of these alternatives. Similarly, implementation of Alternatives Island B or Island C and Alternative A8 B would not result in increased public access and recreational opportunities in the Phase 2 area, and therefore the Action Alternatives for the Island Ponds and A8 Ponds would not result in economic, population, or housing growth.

Implementation of Alternatives Mountain View B or Mountain View C and/or Alternatives Ravenswood B, Ravenswood C, or Ravenswood D would increase public access and recreational opportunities in the

[1] "No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This Final EIS/R uses No Action throughout.

Phase 2 area, potentially resulting in some increase in visits to these pond clusters for hiking, bicycling, photography, wildlife viewing, and other similar activities. These additional visits may bring some economic growth to the area through an increase in area businesses (see Section 3.10, Socioeconomics and Environmental Justice). However, this potential economic growth would be considered minor relative to the local and regional economy. While these Action Alternatives would increase recreational opportunities at the Mountain View Ponds and the Ravenswood Ponds, these areas already include recreational visitation and use within and around them in the adjacent city parks. The additional recreation and public access opportunities are relatively small enhancements to these existing uses, and the projected increases in visitation are expected to be minimal (see Section 3.6, Recreation Resources).

Further, such recreational facilities are not a known constraint to population growth in the San Francisco Bay Area. The proposed improvements are unlikely to induce or encourage additional population growth or development elsewhere, or remove obstacles to population growth. As such, the Phase 2 project would not result in direct growth or induce substantial growth in the region. Potential effects are considered less than significant.

5.4 NEPA Consultation

5.4.1 Federal Endangered Species Act (16 United States Code [USC] Section 1521 et seq.)

Section 7 of the Federal Endangered Species Act (FESA) requires federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. Under Section 7, a project that could result in incidental take of a listed threatened or endangered species must consult with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) – depending on the species in question – to obtain a Biological Opinion (BO). If the BO finds that the project could jeopardize the existence of a listed species (“jeopardy opinion”), the agency cannot authorize the project until it is modified to obtain a “nonjeopardy opinion.”

Impacts to federally endangered and threatened species are discussed in Section 3.5, Biological Resources. In the past, at the programmatic level, the lead agencies (USFWS and the California Department of Fish and Wildlife [CDFW]), whose mandates include protecting fish and wildlife resources, have conducted extensive formal consultation with the USFWS Endangered Species Unit regarding potential impacts of the 50-year SBSP Restoration Project as a whole. A Programmatic BO was issued and has guided the development and implementation of the program itself as well as the Phase 1 activities.

For Phase 2, consultation will occur in the form of one or more project-level Biological Assessments (BA), leading to a BO. This will address the potential impacts on FESA-listed species from the selected alternative at each of the Phase 2 pond clusters. Generally, as described in Section 3.5, Biological Resources, potential significant effects to these federally listed species would either be avoided through the implementation of the Adaptive Management Plan (AMP) that is an integral part of the Phase 2 project, or through implementation of measures established in the BA/BO to avoid or minimize potential effects to biological resources. Prior to construction of the Phase 2 project, the lead agencies would obtain concurrence from the USFWS Endangered Species Unit that the Phase 2 project, with implementation of the measures established in the AMP and BO, would not adversely affect federally listed endangered or threatened species. Concurrence by USFWS would fulfill the requirements of this act.

5.4.2 Fish and Wildlife Coordination Act (16 USC Section 651 et seq.)

The Fish and Wildlife Coordination Act requires that agencies consult with fish and wildlife agencies (federal and state) on projects where the waters of any stream or other body of water are proposed or authorized to be impounded or diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatsoever, including navigation and drainage, that could affect biological resources. Compliance with the Fish and Wildlife Coordination Act will be achieved through consultation with USFWS, NMFS, and CDFW by federal agencies when issuing permits for Phase 2 activities by sponsoring agencies or when implementing other activities related to the Phase 2 project.

5.4.3 Federal Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act prohibits the take of migratory birds (or any part, nest, or eggs of any such bird). Executive Order (EO) 13186 requires that any project with federal involvement address impacts of federal actions on migratory birds. Impacts to migratory birds and other protected birds and their nests are discussed in Section 3.5, Biological Resources, of this Final EIS/R. Potential significant effects to these species would be avoided through project designs that include seasonal avoidance of migratory birds, through implementation of the AMP, and through implementation of measures established in the BA/BO and other regulatory documents. The analyses provided in Section 3.5 demonstrate lead agency compliance with the Migratory Bird Treaty Act and EO 13186.

5.4.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the destruction of bald and golden eagles and their occupied and unoccupied nests. Impacts to bald and golden eagles and their nests are discussed along with other raptor species in Section 3.5, Biological Resources, of this Final EIS/R. Potential significant effects to these species would be avoided through project designs that include seasonal avoidance of migratory birds, through implementation of the AMP, and through implementation of measures established in the BA/BO and other regulatory documents. The analyses provided in Section 3.5 demonstrate lead agency compliance with the Bald and Golden Eagle Protection Act.

5.4.5 National Historic Preservation Act (15 USC Section 470 et seq.)

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to evaluate the effects of federal undertakings on historical, archaeological, and cultural resources. As described in Section 3.7, Cultural Resources, of this Final EIS/R, the Section 106 review process occurs in four steps: initiation of the process, identification of historic properties, assessment of adverse effects, and resolution of adverse effects. As part of the Section 106 process initiation, which occurred as part of the SBSP Restoration Project, USFWS requested consultation with the California State Historic Preservation Officer (SHPO) regarding the SBSP Restoration Project as a whole. USFWS sent a letter to the Office of Historic Preservation in July 2004 to introduce the project, define the project's Area of Potential Effect (APE), establish the scope of the identification effort, and suggest the methods for consulting with SHPO. In addition, USFWS requested that the program alternatives be considered by SHPO under the 1997 Programmatic Agreement between the SHPO and USFWS; activities that do not meet the requirements of the agreement would then proceed through the standard Section 106 process. USFWS also indicated that the historic context report of the solar salt industry and evaluation framework for identifying historic resources within the APE would be provided to SHPO for review and comment. SHPO responded in November 2004, concurring with the USFWS delineation of the project's APE. In 2010, SHPO concurred with a finding of adverse effect for project impacts to the National Register of Historic Places-eligible Alviso Salt Works Historic Landscape and Eden Landing Salt Works Historic Landscape. Pursuant to this finding, a Memorandum of Agreement (MOA) was developed between USFWS and SHPO that outlines mitigation and the protocol for completion of the Section 106 process (Appendix J).

Since the long-term restoration would occur over a 50-year planning period, the identification of historic properties and the assessment of effects would be phased to match project phasing, such as with this Final EIS/R for Phase 2. To facilitate an identification effort that is consistent and comprehensive throughout the life of the project, USFWS has provided SHPO with an historic context and an evaluation framework that will serve as the basis for eligibility determinations. Potential effects of the Phase 2 project associated with cultural resources are addressed in Section 3.7, Cultural Resources, of this Final EIS/R. In addition, during the programmatic phase, USFWS consulted with SHPO on Phase 2 additions to the APE. SHPO has concurred that there are no additional historic properties affected as a result of the Phase 2 APE additions. The analysis provided in Section 3.7 and the updated (2014) consultation with SHPO ensure that the USFWS continues to comply with the NHPA.

5.4.6 Executive Order 11988 – Floodplain Management and Executive Order 11990 – Protection of Wetlands

Executive Order 11988 requires federal agencies to recognize the value of floodplains and to consider the public benefits from restoring and preserving floodplains. Section 3.2, Hydrology, Flood Management, and Infrastructure, describes EO 11988 in more detail. Under EO 11990, federal agencies must avoid affecting wetlands unless it is determined that there is no practicable alternative.

As discussed in Chapter 1, Introduction, two of the objectives of the proposed Phase 2 project are to: (1) create, restore, or enhance habitats of sufficient size, function, and appropriate structure to promote restoration of native special-status plants and animals, maintain current migratory bird species, support increased abundance and diversity of native species, and (2) maintain or improve existing levels of flood protection in the South Bay.

Section 3.2, Hydrology, Flood Management, and Infrastructure, discusses in further detail the potential project impacts associated with coastal flood risk. The objectives of the project as well as the analysis provided in Section 3.2 demonstrate compliance with EO 11988.

The Phase 2 Action Alternatives would impact some areas that are currently tidal wetlands. Section 3.5, Biological Resources, describes the location, amount, type, and reasons for these impacts to existing wetlands. However, the combined area of these impacts is small (on the order of tens of acres), while the implemented Phase 2 actions would restore and enhance almost 2,500 acres of tidal wetlands. Thus, the objectives of the project as well as the analysis in Section 3.5 demonstrate compliance with EO 11990.

5.4.7 Farmland Protection Policy Act (7 USC Section 4201 et seq.)

The Farmland Protection Policy Act (FPPA) requires a federal agency to consider the effects of its actions and programs on the nation's farmlands. The FPPA is intended to minimize the impact of federal programs with respect to the conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. As discussed in Section 3.8, Land Use and Planning, no designated important farmlands are located within the Phase 2 area. As such, the lead agencies would be in compliance with this act.

5.4.8 Executive Order 12898 – Social Justice

Executive Order 12898 prohibits discrimination against or exclusion of individuals and populations during the conduct of federal activities. It requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs and activities on minority and low-income populations. Section 3.10, Socioeconomics and Environmental Justice, describes the socioeconomic setting as it relates to the Phase 2 area and evaluates the potential for the project to disproportionately affect minority or low-income groups. As described in Section 3.10, the Phase 2 project would not disproportionately affect minority and low-income communities. The analysis provided in this Final EIS/R regarding socioeconomic effects demonstrates lead agency compliance with this EO.

5.4.9 Executive Order on Trails for America in the 21st Century

The executive order on Trails for America requires federal agencies to protect, connect, promote, and assist trails of all types throughout the United States. As described in Chapter 1, Introduction, one of the objectives of the Phase 2 project is to provide public access and recreation opportunities compatible with wildlife and habitat goals. Chapter 2, Alternatives, communicated the amounts and locations of new recreational trails and associated public access opportunities (e.g., viewing stations and interpretive platforms). Section 3.6, Recreation Resources, further describes the existing and proposed recreation facilities within Phase 2 project area, as well potential effects (including beneficial outcomes, where appropriate) on such resources. The Phase 2 project would provide public access and recreation opportunities, including new trails, in the project area. Therefore, the analysis provided in this Final EIS/R demonstrates lead agency compliance with this EO.

5.4.10 Clean Air Act

Federal agencies must ensure that their actions conform to applicable federal, state, or tribal implementation plans for achieving national ambient air quality standards. To conform, federal actions must not contribute to new violations of the standards, increase the frequency or severity of existing violations, or delay the timely attainment of standards in the area of concern. Section 3.13, Air Quality, describes existing conditions in the project area, regulations relevant to air quality, and potential air quality effects resulting from the Phase 2 project. The analysis provided in Section 3.13 demonstrates lead agency compliance with this act.

6. PHASE 2 PREFERRED ALTERNATIVE AND OTHER NEPA/CEQA ALTERNATIVES

This chapter describes the Preferred Alternative for the Phase 2 actions at the U.S. Fish and Wildlife Service's (USFWS) Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). It also identifies the Environmentally Preferred Alternative (a National Environmental Policy Act (NEPA) requirement) and the Environmentally Superior Alternative (a California Environmental Quality Act (CEQA) requirement.

The Preferred Alternative would be implemented at four geographically distinct pond clusters within the Refuge. Three of those pond clusters are within the larger Alviso pond complex. These are the Alviso-Island Ponds (or simply, the Island Ponds), the Alviso-Mountain View Ponds (the Mountain View Ponds), and the Alviso-A8 Ponds (the A8 Ponds). The fourth is the Ravenswood Ponds, which are within the Ravenswood pond complex.

The various action alternatives at each of these pond clusters are described in detail in Chapter 2 and analyzed thoroughly in Chapter 3. The potential for Cumulative Impacts is discussed in Chapter 4. Chapter 5 presents other NEPA and CEQA considerations. This chapter is organized as follows:

- Section 6.1 is about the Preferred Alternative.
    - Section 6.1.1 identifies and provides an overview of the Preferred Alternative, its main components, and the process by which it was developed and selected.
    - Section 6.1.2 discusses in detail how the Preferred Alternative at the Island Ponds was developed from the action alternatives presented in the Draft EIS/R. It also describes what minor modifications, if any, were made to those action alternatives and explains why they were made. This section also includes a discussion of how the Preferred Alternative at the Island Ponds fits into the impact analysis presented in the Draft EIS/R.
    - Section 6.1.3 provides an analogous discussion for the Mountain View Ponds.
    - Section 6.1.4 provides an analogous discussion for the A8 Ponds.
    - Section 6.1.5 provides an analogous discussion for the Ravenswood Ponds.
    - Section 6.1.6 presents a summary of the significance determinations for the Preferred Alternative.
- Section 6.2 presents and discusses the Environmentally Preferred Alternative.
- Section 6.3 presents and discusses the Environmentally Superior Alternative.

6.1 Phase 2 Preferred Alternative

6.1.1 Identification of the Phase 2 Preferred Alternative

This section identifies the Preferred Alternative, as it would be implemented at each of the four pond clusters evaluated for Phase 2 at the Refuge ponds. The federal and state lead agencies (the USFWS and the State Coastal Conservancy, respectively) along with the Project Management Team and other project partners did not specify a Preferred Alternative in the Draft EIS/R for Phase 2. Instead, by waiting until this Final EIS/R to make that decision, they were able to incorporate input received from the public, regulatory agencies, and other stakeholders on the Draft EIS/R's alternatives and impact analyses to factor into the decision about the Preferred Alternative. Many of the comments on the Draft EIS/R contained statements supporting or opposing particular components of the alternatives in the document.

Those comments informed and shaped the selection of the Preferred Alternative from individual components from the various action and no-action alternatives presented in the Draft EIS/R, as well as minor adjustments and some recombination of them into a complete Preferred Alternative. Further, as was described in the 2007 EIS/R and other project planning documents, the SBSP Restoration Project's approach has been to take the lessons learned from each project phase and from the ongoing applied studies and other scientific research and monitoring and allow them to inform future phases. These observations and results were also used to shape the selection of components to form the Preferred Alternative.

Finally, the selection of what to include in the Phase 2 Preferred Alternative was shaped by a sense of how the SBSP Restoration Project's goals and objectives could be met while minimizing the environmental impacts associated with various parts of the project implementation. Many of these potential impacts were from the volumes of fill that would need to be imported and placed into the ponds for habitat enhancements or for levee improvements. Even though these impacts were found to be less than significant in the Draft EIS/R, the realization that the purpose and need of the project could be met while further reducing the impacts drove many of the decisions. Other decisions were driven by feasibility, constructability, or regulatory constraints. The details of these are discussed for each pond cluster in the following sections.

The Phase 2 Preferred Alternative provides a variety of habitat enhancements at all four Phase 2 pond clusters. It also includes maintained or increased flood protection and additional public access and recreation features at two of the pond clusters. **Figures 6-1** through **6-4** illustrate the Preferred Alternative as it would be implemented at each of the Phase 2 pond clusters. This document uses the phrasing "the Preferred Alternative at the Island Ponds" (choosing one pond cluster as an example) to refer to the pond cluster-specific parts of the Preferred Alternative.

These pond cluster-specific choices are discussed in detail in the following sections. Here, however, is a summary of the four parts of the Preferred Alternative as it would be implemented:

- The Preferred Alternative at the Island Ponds is Alternative Island B with one restoration component of Alternative Island C included.
- The Preferred Alternative at the Mountain View Ponds is essentially Alternative Mountain View B, with the substitution of one habitat enhancement from Mountain View C and the addition of one public access component also from Mountain View C. There is also a modification of one of the levee improvement features presented in the two action alternatives.
- The Preferred Alternative at the A8 Ponds is Alternative A8 B, except that the top elevation of the proposed transition zones has been increased to provide greater erosion protection.
- The Preferred Alternative at the Ravenswood Ponds is similar to Alternative Ravenswood B, in its restoration goals and features for Ponds R3, R4, R5, and S5, but it also includes an additional habitat transition zone and a trail on the eastern edge of Ponds R5 and S5, all of which were included in Alternatives Ravenswood C and D.

The Preferred Alternative, as well as all of the elements of it at each pond cluster, is made up entirely of the individual components that were presented and analyzed in the Draft EIS/R and that are included again in this Final EIS/R, in Chapters 3-5. The combinations of those components are somewhat different than those presented in the Draft EIS/R's action alternatives, but there are no new components, new analyses, new significant impacts, or new mitigation measures. In a few cases, minor clarifications and refinements to the individual components were made either in response to suggestions in the comments received or to guidance from regulatory agencies. In others, design improvements and enhancements have been made since the Draft EIS/R was initially circulated. These enhancements would improve the restoration and flood protection goals and/or would increase the likelihood of successfully achieving the project goals. These changes do not increase, and in most cases decrease, the potential for significant environmental impacts. For example, there could be less earth moved or a smaller footprint. These clarifications or refinements are noted in the text and tables in each of the following sections.

6.1.2 Preferred Alternative at the Island Ponds

Description and Explanation

Table 6-1 compares Alternative Island B and Alternative Island C with the Preferred Alternative at the Island Ponds, which is illustrated in **Figure 6-1**. As can be seen, the Preferred Alternative at the Island Ponds is much like Alternative Island B, as it was described in the Draft EIS/R, with a few minor modifications and one component from Alternative Island C.

Alternative Island B was chosen as the starting point for the Preferred Alternative at the Island Ponds because it would achieve all of the project's Phase 2 goals and objectives for this pond cluster with a reduced level of impacts compared to Alternative Island C. Alternative Island C included changes to levees around Ponds A20 and A21, as well as to the existing pond bottom within the center of Pond A19. Alternative Island B has none of these actions, all of which necessitate a greater degree of earth moving and construction as well as habitat disturbance. Further, the benefit of that added level of effort in Alternative Island C was questioned because Ponds A21 and A21 are achieving their restoration goals without further action. Therefore, most of the additional actions in Alternative Island C were discarded, and the Preferred Alternative includes the Alternative Island B components with changes as discussed in the following paragraphs.

As in Alternative Island B, the Preferred Alternative includes the two breaches on the north side of Pond A19 and removal of most of the western levee of Pond A19 and the eastern levee of Pond A20. This levee removal to the elevation of the strip of marsh between the two ponds would create a larger area of connected aquatic habitat. Also, as in Alternative Island B, there would be extensive lowering of portions of Pond A19's northern levee. However, in a variation from what was described in the Draft EIS/R, this lowering would be only to mean higher high water instead of to mean high water, as was assessed in that document. In the Preferred Alternative at the Island Ponds, portions of those levees would be left at the starting elevation to provide more high-tide refugia and roosting or nesting areas.

The Draft EIS/R describes that material from levee breaching, lowering, and removal would be sidecast into the ponds to fill borrow ditches and thereby speed the ponds' transition to marsh plain elevation. It was suggested in the comments to make that general concept more specific by adding ditch blocks. Ditch blocks are built by placing fill material inside of the historic borrow ditches to direct tidal flows into the center of the ponds instead of allowing them to flow around the interior perimeter. The Preferred

Alternative calls for the targeted placement of material from levee breaching or other modification into specific locations along the borrow ditches. This material would then be compacted to form several ditch blocks in those channels. This is a more specific version of the plan to sidecast levee material into the ponds, as described in the Draft EIS/R.

One component from Alternative Island C would be partially included in the Preferred Alternative. Alternative Island C included widening of the two existing breaches on the southern levee of Pond A19. In the Preferred Alternative, only the westernmost of those two existing breaches would be widened. The methods for doing so would be as described in the Draft EIS/R and shown in **Figure 6-1**.

Finally, the exact location of the levee breaches and the lowering on the north side of Pond A19 would be selected to avoid individual small spikerush (*Eliocharis parvula*) plants that have been observed on this levee in recent years.

Summary of Impact Analysis from Chapter 3

The Preferred Alternative at the Island Ponds is extremely similar to Alternative Island B. The potential for adverse environmental impacts from this portion of the Preferred Alternative, as well as the expected benefits, would therefore be almost identical to those discussed for Alternative Island B in Chapters 3-5 of the Draft and Final versions of this EIS/R. The significance determinations were either “No Impact” or “Less than Significant.” The differences are discussed in the following paragraphs.

As explained in Table 6-1 and in the preceding section of text, part of one component from Alternative Island C will be included in the Preferred Alternative at these ponds. The Draft EIS/R analyzed and disclosed the potential impacts of widening both the southern-side breaches in Pond A19 to increase circulation into and out of the pond. In Alternative Island B, those breaches were unchanged. The Preferred Alternative at the Island Ponds includes a midpoint between those extremes by only widening one breach (the western one). The potential impacts from the construction work itself would thus be reduced relative to those presented in Alternative Island C, which were also less than significant.

Both action alternatives in the Draft EIS/R included lowering sections of existing levees to mean high water. In the Preferred Alternative, the linear extent of that lowering would be the same as that presented for Alternative Island B. However, the Preferred Alternative would change the degree of levee lowering to mean higher high water. This would result in less earth moving, a shorter construction period, and overall reduced short-term environmental impacts relative to those presented for the action alternatives, while providing greater potential for long-term high-tide refugia for special-status wildlife species.

A similar reduction in impacts, while creating the same type of long-term habitat enhancements, would come from the decision for the Preferred Alternative to not lower or remove all of the designated portions of those levees. Instead, there would be small portions of the existing levees left unchanged to act as habitat islands, bird roosting areas, and high-tide refugia. The result would be slight reductions in the magnitudes of effects that were noted from earth-moving and other construction activities, as well as for the potential impacts on various guilds and species of birds that might roost or nest on the existing levees. While those impacts were found to be less than significant, this change would reduce them further and bring additional habitat benefits for birds and terrestrial species while not substantially reducing the benefits from lowering and removing the rest of those levees, as described.

Table 6-1. Comparison of Alternatives at the Alviso-Island Ponds

ALTERNATIVE ISLAND B	ALTERNATIVE ISLAND C	PREFERRED ALTERNATIVE AT THE ISLAND PONDS
Breach north side of Pond A19 in two places.	Breach north side of Pond A19 in two places.	As described in Alternatives Island B and C: breach north side of Pond A19 in two places. *Clarifications and refinements: Locate breaches to avoid small spikerush plants. Sidecast material into ponds to fill borrow ditches, build ditch blocks, and create raised areas. Lower levees only to mean higher high water instead of mean high water.*
Lower or remove much of Pond A19’s northern and southern levees.	Lower or remove much of Pond A19’s northern and southern levees.	As described in Alternatives Island B and C: lower or remove much of Pond A19’s northern and southern levees west of the western breaches. *Clarifications and refinements: Lower levees only to mean higher high water instead of mean high water. Leave several high sections of existing levees to serve as high-tide refugia. Sidecast material as described above.*
Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.	Remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds.	As described in Alternatives Island B and C: remove Pond A19’s western levee and Pond A20’s eastern levee to connect these two ponds. *Clarifications and refinements: Leave several high sections of existing levees to serve as high-tide refugia. Sidecast material as described above.*
Do not breach north sides of Ponds A20 and A21.	Breach the north sides of Ponds A20 and A21.	As described for Alternative Island B: do not breach north sides of Ponds A20 and A21.
Do not lower or remove Pond A20's northern or southern levees.	Lower portions of Pond A20’s northern and southern levees.	As described for Alternative Island B: do not lower or remove Pond A20's northern or southern levees.
Do not widen existing breaches on Pond A19’s southern side.	Widen existing breaches on Pond A19’s southern side.	A scaled-down version of that described in Alternative Island C: widen only the westernmost of the two existing breaches on south side of Pond A19. Sidecast material as described above.
Do not excavate pilot channels within Pond A19.	Excavate two pilot channels within Pond A19.	As described for Alternative Island B: do not excavate pilot channels within Pond A19.

AECOM

South Bay Salt Pond Restoration Project

Figure 6-1

Preferred Alternative Island Ponds

The final modification involves the placement of the breach locations on the north side of Pond A19. As noted in Table 6-1 and in the preceding section, these choices were made to avoid the need to relocate or risk affecting individual small spikerush plants. The small spikerush is not a listed species under the federal or California Endangered Species Act, but it is comparatively rare. Selecting the breach locations to avoid individuals of this species would eliminate the need to relocate the individuals and thus further reduce the potential for adverse impacts. This is a design decision that provides an additional layer of protection for this species and does not change the impact significance determinations.

This discussion demonstrates that the impacts of the portion of the Preferred Alternative that would be implemented at the Island Ponds is generally similar to, but in some cases somewhat less than, that presented for Alternative Island B in the earlier chapters of this EIS/R. Where its impacts would vary from those discussed in Alternative Island B, they are similar to – but reduced in magnitude from – those presented for Alternative Island C.

6.1.3 Preferred Alternative at the Mountain View Ponds

Description and Explanation

Table 6-2 compares Alternative Mountain View B and Alternative Mountain View C with the Preferred Alternative at the Mountain View Ponds, which is illustrated in **Figure 6-2**. As can be seen, the Preferred Alternative for the Alviso-Mountain View Ponds is much like Alternative Mountain View B, as it was described in the Draft EIS/R, with a few minor modifications and components drawn from Alternative Mountain View C as it was described in the Draft EIS/R. The proposed modifications would further reduce the less than significant environmental impacts relative to those presented in the Draft EIS/R while still achieving the project's goals.

Alternative Mountain View B was chosen as the starting point for the Preferred Alternative at the Mountain View Ponds because it could achieve the project's Phase 2 goals and objectives for this pond cluster with a reduced level of impact relative to that presented in Alternative Mountain View C and because of feasibility and regulatory difficulties that would have been realized if the full version of Alternative C had been pursued.

The main difference between Alternatives Mountain View B and Mountain View C in the Draft EIS/R was the inclusion of Charleston Slough into the Phase 2 actions. In the portion of the Preferred Alternative at the Mountain View Ponds, the connection of Charleston Slough to Pond A1 is not included. There are several reasons for this decision.

Restoration of approximately half of Charleston Slough to tidal marsh is a regulatory requirement for the City of Mountain View under a permit from the San Francisco Bay Conservation and Development Commission (BCDC). It is not a decision to be made by either the City of Mountain View or the SBSP Restoration Project. The inclusion of Charleston Slough in Phase 2 of the SBSP Restoration Project (instead of as a separate project to be undertaken by the city) was initially considered because such a joint effort would reduce the financial cost, the temporary environmental impacts associated with construction, and the permanent environmental impacts of having an improved levee between two restoring marshes. Linking the two areas would also increase the ecological function and habitat connectivity of the two marshes.

However, in the public comments on the Draft EIS/R, a number of regulatory agencies expressed concern about the potential effects on steelhead and other estuarine fish under Alternative Mountain View C. At the center of this concern is the question of whether the combined elements of the initial proposal for Alternative Mountain View C in the Draft EIS/R would have an impact on these fish. The increased connectivity between Stevens Creek, Pond A1 and Pond A2W was planned to provide additional nursery habitat for outmigrating steelhead and good general use habitat for other estuarine fish. However, these changes would have necessitated moving the water intake for the Shoreline Park sailing lake. That relocation into the breach at the southwest corner of Pond A1 would have the potential to entrain some of these fish.

In coordination with the National Marine Fisheries Service (NMFS), the SBSP Restoration Project has concluded that without a fish screen in place at the new water intake location, the effects could rise to the level of a significant impact and "take" of a species listed under the Endangered Species Act. A fish screen would thus likely be a required part of this project component. However, the limited area available for the water intake would be inadequate to accommodate the enlarged size of the new intake and screen necessary to provide adequate flows to the sailing lake. That technical and logistical infeasibility, combined with the very high initial capital cost and ongoing operations and maintenance costs, make it impracticable to include the fish screen for the water intake at this new location. Yet under Alternative C, without the water intake at the breach location, it is not clear that the City of Mountain View could meet the Shoreline Park sailing lake' water demand.

Therefore, most of the actions from Alternative Mountain View C that include linking Charleston Slough to Phase 2 of the SBSP Restoration Project were discarded. The Preferred Alternative includes the Alternative Mountain View B components with a few components described and analyzed under Alternative Mountain View C and other minor design changes as listed in the following bullets.

- In the Preferred Alternative, the changes to the Coast Casey Forebay levee and its associated structures (including the existing trail and viewing platform, utility access, access to the pump station building, etc.) would be largely as described for Alternative Mountain View C, except for those related to the new location for the sailing lake's water intake. For reference, **Figure 6-2a** and its inset map, **Figure 6-2b**, show the extent of the improved levee.
- The improved Coast Casey Forebay levee would be as wide as described for Alternative Mountain View C, but would be to an elevation 8 inches higher than that described in the Draft EIS/R.
- The breaches into Pond A1 for the Preferred Alternative would be as described for Alternative Mountain View C except the breach near Pond A1's southwest corner would not be implemented. There would be only two breaches into Pond A1, as shown on **Figure 6-2**.
- The habitat transition zone in Pond A2W would be as described for Alternative Mountain View C, which would not extend all the way across the southern border of the pond.
- The number of proposed habitat islands constructed in each pond has been reduced from eight per pond to three to five islands per pond.
- Alternative Mountain View C included a public access trail on the existing levee along the eastern and northern borders of Pond A2W. As shown on **Figure 6-2**, the Preferred Alternative at the Mountain View Ponds includes a shorter version of this trail, which would end at a viewing platform at the northeast corner of the pond instead of extending all the way to the northwest corner.

Table 6-2. Comparison of Alternatives at the Alviso-Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C	PREFERRED ALTERNATIVE AT THE MOUNTAIN VIEW PONDS
Do not include Charleston Slough in tidal marsh restoration.	Include Charleston Slough in tidal marsh restoration.	As described for Alternative Mountain View B: do not include Charleston Slough in tidal marsh restoration.
Raise and improve western levee of Pond A1.	Lower and breach western levee of Pond A1.	As described for Alternative Mountain View B: raise and improve western levee of Pond A1.
Breach the west side of Pond A1 at one location.	Breach Pond A1 at three locations.	Largely as described for Alternative Mountain View C: breach Pond A1 at more than one location. *Clarifications and refinements: breach at only two of the three locations in that alternative.*
Do not breach Charleston Slough and connect it to Pond A1.	Breach Charleston Slough and connect it to Pond A1 (necessarily includes the italicized listed subcomponents below).	As described for Alternative Mountain View B: do not breach Charleston Slough to connect it to Pond A1. *Clarifications and refinements: include only the subcomponents from Alternative C as listed below.*
	§ Open Charleston Slough to full tidal exchange, by breaching the northern levee or by removing the tide gate structure itself, to allow vegetation to colonize the mud flats surrounding the slough's main channel.	*§ Not included.*
	§ Raise and improve the western levee of Charleston Slough, which separates it from the Palo Alto Flood Basin.	*§ Not included.*
	§ Raise the Coast Casey Forebay levee along southern border of Charleston Slough and associated sailing lake water intake and pump station structures.	*§ Raise the Coast Casey Forebay levee along southern border of Charleston Slough and necessary utilities.*
	§ Add a primary water intake for the Mountain View Shoreline Park sailing lake at the breach in the levee between Charleston Slough and Pond A1.	*§ Not included.*
	§ Lower western levee of Pond A1.	*§ Not included.*
	§ Rebuild the existing viewing platform along the Coast Casey Forebay levee; rebuild the existing trail and replace benches and signage along the improved western levee of Charleston Slough.	*§ Rebuild the existing trail, viewing platform, benches, and signage along the Coast Casey Forebay levee.*
	§ Armor levee on landward side of breach between Pond A1 and Charleston Slough.	*§ Not included.*

Table 6-2. Comparison of Alternatives at the Alviso-Mountain View Ponds

ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C	PREFERRED ALTERNATIVE AT THE MOUNTAIN VIEW PONDS
Construct bird habitat islands in Ponds A1 and A2W.	Construct bird habitat islands in Ponds A1 and A2W.	As described for Alternatives Mountain View B and C: construct bird habitat islands in Ponds A1 and A2W. *Clarifications and refinements: plan is for 3-5 bird habitat islands in each of Ponds A1 and A2W, a lower number than in the Draft EIS/R.*
Construct habitat transition zones across entire southern extent of Ponds A1 and A2W.	Construct a habitat transition zone across entire southern extent of Pond A1 but only across central portion of A2W.	As described for Alternative Mountain View C: construct a habitat transition zone across entire southern extent of Pond A1 but only across central portion of Pond A2W.
Breach Pond A2W at four locations.	Breach Pond A2W at four locations.	As described for Alternatives Mountain View B and C: breach Pond A2W at four locations.
Armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for Pacific Gas and Electric Company (PG&E) access.	Armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for PG&E access and recreational trail access.	As described for Alternative Mountain View C: armor the two eastern breaches of Pond A2W and add railcar bridges over the two breaches for Pacific Gas and Electric Company (PG&E) access and recreational trail access.
Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from Pond A2W to connect to existing boardwalk over Bay outside of the Palo Alto Flood Basin.	Raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from Pond A2W to connect to existing boardwalk over Bay outside of Palo Alto Flood Basin.	As described for Alternatives Mountain View B and C: raise concrete footings of PG&E towers in Pond A2W; elevate existing PG&E access boardwalk in Pond A2W; construct new sections of boardwalk from A2W to connect to existing boardwalk over Bay outside of Palo Alto Flood Basin.
Add viewing platform in Shoreline Park south of Pond A1.	Add viewing platform in Shoreline Park south of Pond A1.	As described for Alternatives Mountain View B and C: add viewing platform in Shoreline Park south of Pond A1.
Construct spur trail on improved western levee of Pond A1 to a viewing platform.	Construct spur trail on improved western levee of Pond A1 to a viewing platform at the armored breach.	As described for Alternative Mountain View B: construct spur trail on improved western levee of Pond A1 to a viewing platform.
Do not add a spur trail from Bay Trail spine along Charleston Slough's northern levee	Add a spur trail from Bay Trail spine along Charleston Slough's northern levee to a viewing platform at or near the breach location.	As described for Alternative Mountain View B: do not add a spur trail from Bay Trail spine along Charleston Slough's northern levee to a viewing platform.
Do not add a recreational trail on eastern or northern levee of Pond A2W.	Add recreational trail on eastern and northern sides of Pond A2W to a bay side viewing platform near PG&E turnaround point.	As described for Alternative Mountain View C: add recreational trail to levee around Pond A2W to a bayside viewing platform on the outer corner of Pond A2W. *Clarifications and refinements: trail would be shorter and end at northeast corner of Pond A2W instead of the PG&E turnaround at the northwest corner.*

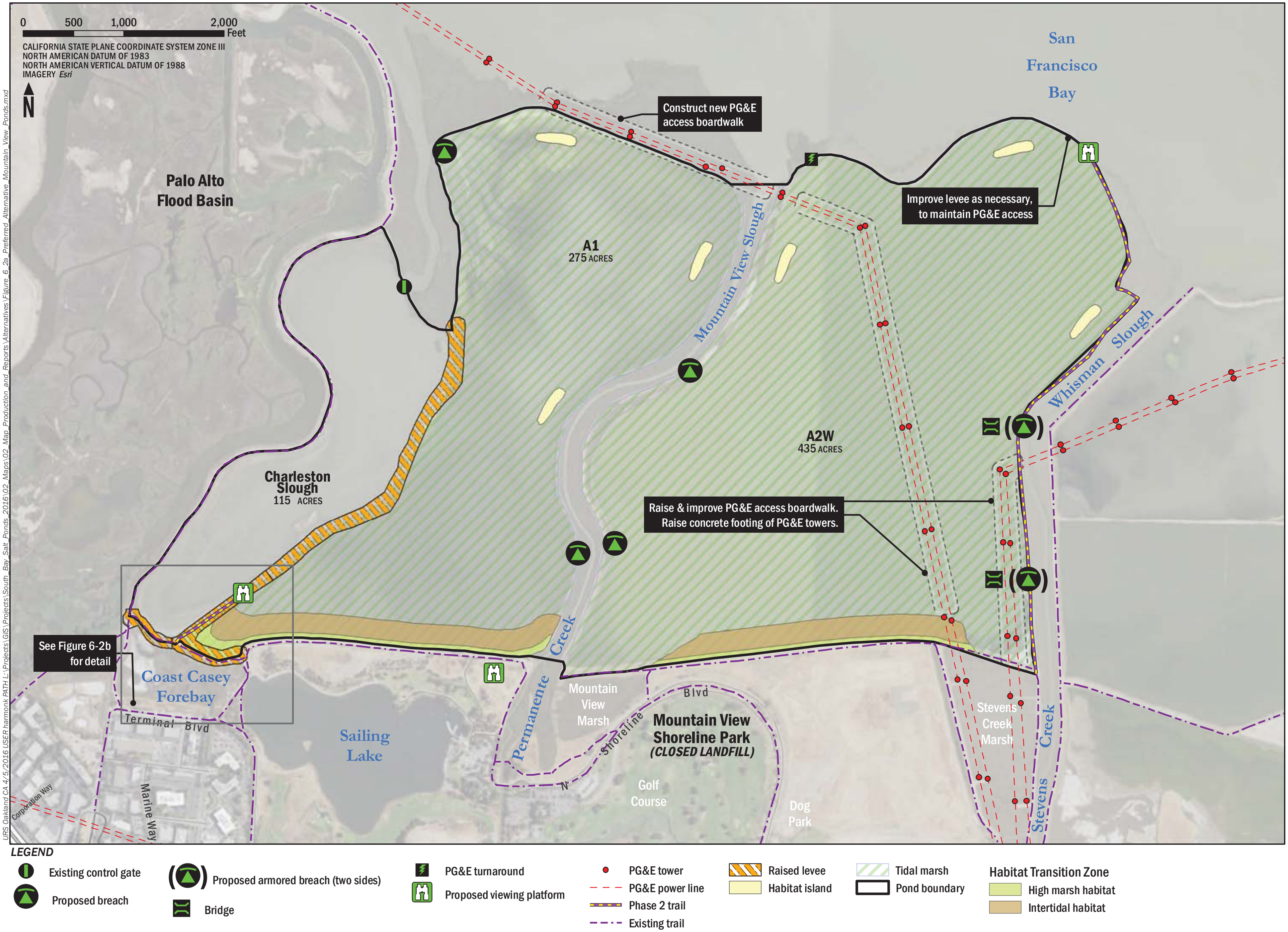

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Figure 6-2a
Preferred Alternative Mountain View Ponds

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LEGEND

Exsiting pipeline
Existing general feature
Extent of levee improvements

AECOM
South Bay Salt Pond Restoration Project

Figure 6-2b
Preferred Alternative Mountain View Ponds - Detail

Habitat Transition Zones at the Mountain View Ponds

As noted above, the Preferred Alternative would include habitat transition zones at the Mountain View Ponds. At the request of the San Francisco Bay Regional Water Quality Control Board, **Table 6-3** presents estimates of the areas and volumes of fill of the habitat transition zones proposed for the Phase 2 action alternatives at the Mountain View Ponds, as well as an estimation of what portion of each of them would be placed at elevations above mean higher high water (MHHW). Fill placed to build transition zones below that tidal elevation would be converting ponds to tidal wetlands, which are another form of waters of the U.S and of the State of California., but fill placed above that elevation would be converting waters to uplands, which has regulatory implications. The potential impacts of this fill are discussed in full in the appropriate sections of Chapter 3. These estimates are based on the material volumes presented in the preliminary design memorandum for this pond cluster (Appendix M to the Draft EIS/R) and are based on simplifying assumptions using the average pond bottom elevation. The lengths are measured along the MHHW elevation and are thus specific to this exercise; slightly different numbers are presented in Chapter 2.

Table 6-3. Estimated Dimensions of Habitat Transition Zones at the Mountain View Ponds

HABITAT TRANSITION ZONE	LENGTH (FEET)	FOOTPRINT AREA (ACRES)	VOLUME (CUBIC YARDS)
Total Dimensions			
Pond A1 Habitat Transition Zone	3,900	21.3	88,000
Pond A2W Habitat Transition Zone	2,600	15.8	81,500
Dimensions Above Mean Higher High Water			
Pond A1 Habitat Transition Zone	3,900	4.4	4,818
Pond A2W Habitat Transition Zone	2,600	2.7	3,472

Summary of Impact Analysis from Chapter 3

The Preferred Alternative at the Mountain View Ponds is similar to Alternative Mountain View B. The potential for adverse environmental impacts from this portion of the Preferred Alternative, as well as the expected benefits, would be similar to those discussed for that action alternative in Chapters 3-5 of the Draft and Final versions of this EIS/R. The significance determinations were either “No Impact” or “Less than Significant.” The differences are discussed in the following paragraphs.

Regarding changes to the plans for the Coast Casey Forebay levee, in both action alternatives, approximately half of that levee, which runs along the southern border of Pond A1 and Charleston Slough and which is owned by the City of Mountain View, would have been raised and improved. In Alternative Mountain View C, that levee raise would have extended the entire length of that levee to elevation 14 feet NAVD88 and would have included raising and improving many of the existing appurtenant structures in and around that levee and/or the access to them. In Alternative Mountain View B, the levee would not have been raised to that height, nor would the improvement have extended the full length of that levee. The Preferred Alternative substitutes the Mountain View C improvements for those limited improvements in Alternative Mountain View B. The reasons for this are that raising and improving only one half of a levee would be less effective and efficient at flood protection and would not maintain the integrity of the existing infrastructure in and around the levee (e.g., the water intake and pumping systems).

This change would bring a range of effects related to areas and volumes of fill, construction duration and emissions, material import, etc. that would be between those described in the Draft EIS/R for Alternative Mountain View B and Alternative Mountain View C. Since the significance determinations regarding impacts from Alternative Mountain View C were also found to be “Less than Significant” or “No Impact”, this part of the Preferred Alternative would also not have significant impacts or require new mitigation measures.

Another proposed change to the Coast Casey Forebay levee would be to add 0.7 feet (8.4 inches) of elevation to bring the proposed top elevation to 14.7 feet NAVD88. This is to comport with recent recommendations and guidance from the U.S. Army Corps of Engineers (USACE) and the Santa Clara Valley Water District (SCVWD) to better adapt to projections for sea-level rise, as resulted from the USACE and the SCVWD’s work on the first phase of the Shoreline Study Project in the South Bay. In Alternative Mountain View C in the Draft EIS/R, the base and foundation of the levee improvements would have been widened enough to support a levee up to 16 feet elevation NAVD88, so the change from 14.0 feet to 14.7 feet elevation would not require additional widening or increase the impacts associated with it.

This change would require additional volumes of material to be imported to the Mountain View Ponds site. However, there are several other changes being made to the Preferred Alternative at the Mountain View Ponds that would reduce the amount of material required such that the total amount of imported fill would be less relative to that presented for either of the two action alternatives. Those reductions would come from the reduced length of the habitat transition zone in Pond A2W, the reduction in numbers of islands per pond from eight to a maximum of five (actual range is three to five), and from the decision to not include Charleston Slough and thus need to improve major portions of the Palo Alto Flood Control Basin levee (these changes are discussed in following paragraphs). The estimates of the previous and revised material volumes are presented in **Table 6-4**.

Given that the total volume of material has decreased, while the footprint, areas of waters filled, and other changes would be similar or reduced from those presented in Alternative Mountain View C, these changes to these aspects of the Preferred Alternative would result in impacts that are less than or equal to those presented in the Draft EIS/R.

Table 6-4. Material Volumes for Selected Components at the Alviso-Mountain View Ponds, by Alternative

COMPONENT	ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C	PREFERRED ALTERNATIVE AT MOUNTAIN VIEW PONDS
Habitat Islands in Ponds A1 and A2W	92,000 cy for 16 total islands	92,000 cy for 16 total islands	58,000 for up to 10 total islands (3-5 per pond)
Pond A2W Habitat Transition Zone	125,700 cy	81, 500 cy	81, 500 cy
Raise levee between Pond A1 and Charleston Slough to SBSP Restoration Project-level	10,400 cy	n/a	10,400 cy

Table 6-4. Material Volumes for Selected Components at the Alviso-Mountain View Ponds, by Alternative

COMPONENT	ALTERNATIVE MOUNTAIN VIEW B	ALTERNATIVE MOUNTAIN VIEW C	PREFERRED ALTERNATIVE AT MOUNTAIN VIEW PONDS
Raise west levee of Charleston Slough and Coast Casey Forebay levee to 14 feet elevation (both levees combined)	n/a	155,000 cy	0 cy[2]
Extra material to raise Coast Casey Forebay levee to 14.7 feet elevation	n/a	n/a	40,000 cy (estimated)
Total (for Changing Components Only)	**228,100**	**328,500**	**189,900 cy**

[1] cy = cubic yards

[2] In Alternative Mountain View C, the material total for these two levee raises was designed and presented together. In the Preferred Alternative, only one of these components is included, so the Coast Casey Forebay levee is presented separately in the next row.)

The Preferred Alternative includes Alternative Mountain View C's proposed habitat transition zone in Pond A2W instead of the one proposed for Alternative Mountain View B. This decision was made to allow for future hydraulic and habitat connections to be made between Pond A2W and the City of Mountain View's existing mitigation marshes that exist south of its two southern corners. Either transition zone option would bring ecological and habitat benefits to species and help protect the closed landfill behind the central portion of the pond, but the selected version keeps more options open for future improvements, requires less fill in the Bay, and needs less material to be imported for Phase 2. All of these factors mean that the potential impacts from this component of the Preferred Alternative would be less than significant, as they were in Alternative Mountain View C.

Both action alternatives in the Draft EIS/R included habitat islands for the near-term use of pond-dependent birds. The preliminary designs for these islands assumed that up to 8 islands would be built in each pond. However, ongoing research by the SBSP Restoration Project's science team and by the U.S. Geological Survey indicate that three to five islands per pond is where the highest restoration values can be realized; additional islands beyond that number bring fewer benefits to the bird guilds and species for which they are intended. They also increase the demand for fill material and increase the total area and volume of fill placed in the Bay. The Preferred Alternative includes three to five islands per pond, depending on the material available. This would achieve the same ecological benefits for birds and other species discussed in the Draft EIS/R at levels of impacts that would be reduced relative to those presented in that document, which were determined to be less than significant, even at the higher number of islands.

Regarding the shorter public access trail on the eastern levee of Pond A2W, some of the above-described habitat islands would be built along the northern margin of Pond A2W. Ending the recreational trail before it approaches the islands would reduce the recreational impacts on the birds that are expected to use the islands while still adding a new public access trail approximately 1 mile long that would provide the experience of being adjacent to the open bay. Again, the proposed benefits (here, a recreational benefit) would be achieved at a lower risk of environmental impact than what was determined to be less than significant.

This discussion demonstrates that the impacts of the portion of the Preferred Alternative that would be implemented at the Mountain View Ponds is generally similar to, but in some cases somewhat less than, that presented for Alternative Mountain View B in the earlier chapters of this EIS/R. Where its impacts would vary from those discussed in Alternative Mountain View B, they are similar to – but reduced in magnitude from – those presented for Alternative Mountain View C.

6.1.4 Preferred Alternative at the A8 Ponds

Description and Explanation

The Preferred Alternative at the Alviso-A8 Ponds, which is illustrated in **Figure 6-3**, is identical to Alternative A8 B, which was the only action alternative discussed in the Draft EIS/R for this pond cluster. Alternative A8 B included building habitat transition zones at the southwest and southeast corners of these ponds to provide all of the various benefits such transition zones provide. These include habitat complexity and diversity, erosion protection for the landfill and levees behind them, and sea-level rise adaptation. The only component of that action alternative modified for the Preferred Alternative is increasing the tops of the proposed habitat transition zones from elevation 7.5 feet NAVD88 to 9 feet NAVD88 for increased erosion protection. There is, however, also a corrected estimate for the volume of material to construct these transition zones.

Habitat Transition Zones at the A8 Ponds

As noted above, the Preferred Alternative would include habitat transition zones at the A8 Ponds. At the request of the San Francisco Bay Regional Water Quality Control Board, **Table 6-5** presents estimates of the areas and volumes of fill of the habitat transition zones proposed for the Phase 2 action alternatives at the A8 Ponds, as well as an estimation of what portion of each of them would be placed at elevations above MHHW. Fill placed to build transition zones below that tidal elevation would be converting ponds to tidal wetlands, which are another form of waters of the U.S. and of the State of California, but fill placed above that elevation would be converting waters to uplands, which has regulatory implications. The potential impacts of this fill are discussed in full in the appropriate sections of Chapter 3. These estimates are based on the material volumes developed for the preliminary design memorandum for this pond cluster (Appendix N to the Draft EIS/R) and then modified and corrected as described in Section 6.1.4.3 below. They are based on simplifying assumptions using the average pond bottom elevation. The lengths are measured along the MHHW elevation and are thus specific to this exercise; slightly different numbers are presented in Chapter 2.

Summary of Impact Analysis from Chapter 3

The portion of the Preferred Alternative that would be implemented at the A8 Ponds is the same as that described and analyzed for Alternative A8 B in the Draft and Final EIS/R. Therefore, the impacts of that part of the Preferred Alternative at the A8 Ponds are very similar in nature and magnitude. The significance determinations were all either “No Impact” or “Less than Significant.”

LEGEND

Existing reversible armored notch

Railroad

Existing trail

Pond boundary

Habitat Transition Zone

High marsh habitat

Intertidal habitat

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Figure 6-3

Preferred Alternative A8 Ponds

Table 6-5. Estimated Dimensions of Habitat Transition Zones at the A8 Ponds

HABITAT TRANSITION ZONE	LENGTH (FEET)	FOOTPRINT AREA (ACRES)	VOLUME (CUBIC YARDS)
Total Dimensions			
Southwest Habitat Transition Zone	2,100	13.1	94,600
Southeast Habitat Transition Zone	2,300	14.8	95,400
Dimensions Above Mean Higher High Water			
Southwest Habitat Transition Zone	2,100	2.3	2,936
Southeast Habitat Transition Zone	2,300	2.4	3,024

As described in Chapter 2, however, there is a corrected estimate for the volume of material as well as a design change in this portion of the proposed Preferred Alternative. The corrected estimate and the increase in the top elevation of the habitat transition zones (from 7.5 to 9 feet) have increased the volume of material that is needed to construct the transition zones. The combined total after these changes make the volume of material to construct the proposed habitat transition zones 190,000 cubic yards. However, these two changes do not cause any new significant impacts, increase the degree or magnitude of any significant impacts (none were identified), or necessitate any new mitigation measures. The reasons for this are that:

- The impacts analysis in the Draft EIS/R already assumed the "worst-case scenario" for number of truck trips required to impact the fill material. That document used the maximum feasible number of truckloads that could be safely brought to the site each day (i.e., the number of trucks that can physically access the site during the construction hours). Therefore, the increase in material volumes would necessarily increase the number of days required to import and place the material, but not the numbers per day or per hour.
- There would be no increase in impacts related to traffic, noise, or air quality, the regulations and the significance thresholds for which are evaluated on a daily basis. The daily or hourly totals would not be increased by this change; only the number of days on which they would occur.
- The overall greenhouse gas emissions will increase, but, as described in Section 3.17, the proposed project has extremely low net emissions and is not close to crossing a significance threshold.
- The footprint area and volume of fill in waters of the U.S. and the State will increase, but these are beneficial forms of fill that are largely self-mitigating, even at their increased magnitudes.
- The other effects would be as described in the Draft EIS/R. Preferred Alternative at the Ravenswood Ponds.

Description and Explanation

Table 6-6 compares the three action alternatives (Alternatives Ravenswood B, C, and D) with the Preferred Alternative at the Ravenswood Ponds, which is illustrated in **Figure 6-4**. As can be seen, the Preferred Alternative for the Ravenswood Ponds is much like Alternative Ravenswood B, as it was described in the Draft EIS/R, with a few minor modifications and two components drawn from

Alternative Ravenswood C and D. The proposed modifications would further reduce the minimal amounts of environmental impacts, relative to those presented in the Draft EIS/R, while still achieving the project's goals.

Alternative Ravenswood B was chosen as the starting point for the Preferred Alternative at the Ravenswood Ponds because it could achieve the project's Phase 2 goals and objectives for this pond cluster with a reduced level of impact relative to the other action alternatives and because of feasibility and regulatory difficulties that would have been realized if the other action alternatives had been pursued.

The largest difference between the three action alternatives is the restoration and flood protection actions that were being considered for Ponds R5 and S5 (and the small forebay to S5). In Alternative Ravenswood B, these two small ponds would be combined, fitted with water control structures, and enhanced to be shallow managed ponds for dabbling ducks and small shorebirds. In Alternative Ravenswood C, they would be graded and managed to simulate intertidal mudflats. And in Alternative Ravenswood D, they would be deeper managed ponds and would also be connected to a diversion channel for peak flows of stormwater runoff from a neighboring project. That project was the City of Redwood City's Bayfront Canal and Atherton Channel (BCAC) Project.

The intertidal mudflat option for Ponds R5 and S5, described in Alternative Ravenswood C, was determined to be of less ecological restoration benefit than the shallow managed ponds that were described for Alternative B, and would also be substantially harder to operate and maintain. The connection with the BCAC Project proposed under Alternative Ravenswood D had to be eliminated because its inclusion presented both regulatory and environmental constraints. It would have been necessary to control and monitor the quality of the stormwater runoff that would be occasionally diverted into Ponds R5 and S5. The SBSP Restoration Project as well as multiple regulatory agencies that reviewed the Draft EIS/R noted that a water quality monitoring and control plan would be necessary to ensure that the water diverted into the ponds would not have adverse impacts to the pond environment. Such a water quality control and monitoring plan was not developed and circulated to the regulatory agencies. Without the information provided by a water quality monitoring and control plan, the SBSP Restoration project cannot fully analyze the impacts of the BCAC Project. This precluded Alternative Ravenswood D's restoration plan for Ponds R5 and S5 being included in the Preferred Alternative for Phase 2. However, this does not preclude future implementation of the BCAC Project, subject to appropriate water quality monitoring and control plans and appropriate NEPA and CEQA processes.

For those reasons, the Preferred Alternative at Ravenswood is similar to Alternative Ravenswood B, which includes the enhancement of Ponds R5 and S5 as shallow water ponds. The Ravenswood portion of the Preferred Alternative would also include all other aspects of what was presented for Alternative Ravenswood B in the Draft EIS/R, plus three components from the other action alternatives included in the Draft EIS/R and several minor modifications to further reduce impacts, all of which are described in the following list. The consequences of these changes are described in the following section.

- As described in Alternatives Ravenswood C and D, the water control structure between Pond R3 and Pond S5 would be included.
- As described in Alternatives Ravenswood C and D, the habitat transition zone extending from the All-American Canal into Pond R4 would be included.

Table 6-6. Comparison of Alternatives at the Ravenswood Ponds

ALTERNATIVE RAVENSWOOD B	ALTERNATIVE RAVENSWOOD C	ALTERNATIVE RAVENSWOOD D	PREFERRED ALTERNATIVE AT THE RAVENSWOOD PONDS
R5/S5 as shallow managed ponds.	R5/S5 as intertidal mudflats.	R5/S5 as deeper managed ponds for Bayfront Canal & Atherton Channel connection.	As described for Alternative Ravenswood B: R5/S5 as shallow managed ponds.
No connection from Bayfront Canal into S5's triangular forebay.	No connection from Bayfront Canal into S5's triangular forebay.	Connect S5's triangular forebay to Bayfront Canal.	As described for Alternatives Ravenswood B and C: no connection from Bayfront Canal into S5's triangular forebay.
Improve All-American Canal levee.	Improve All-American Canal levee.	Improve All-American Canal levee.	As described for Alternatives Ravenswood B, C and D: improve All-American Canal levee. *Clarifications and Refinements: extend levee improvements around to southern margin of S5.*
No All-American Canal habitat transition zone.	All-American Canal habitat transition zone.	All-American Canal habitat transition zone.	As described for Alternatives Ravenswood C and D: All-American Canal habitat transition zone.
Bedwell Bayfront Park habitat transition zone.	Bedwell Bayfront Park habitat transition zone.	No Bedwell Bayfront Park habitat transition zone.	As described for Alternatives Ravenswood B and C: Bedwell Bayfront Park habitat transition zone.
No Pond R4 Northwest habitat transition zone.	No Pond R4 Northwest habitat transition zone.	Pond R4 Northwest habitat transition zone.	As described for Alternatives Ravenswood B and C: no transition zone in northwest corner of Pond R4.
Remove parts of Ponds R5 and S5 internal levees.	Remove parts of Ponds R5 and S5 levees.	Remove all of Ponds R5 and S5 internal levees.	As described for Alternatives Ravenswood B and C: remove parts of Ponds R5 and S5 internal levees.
Do not grade and partially fill Ponds R5/S5.	Grade and partially fill Ponds R5/S5.	Do not grade and partially fill Ponds R5/S5.	As described for Alternatives Ravenswood B and D: do not grade or fill Ponds R5/S5.
Ponds R4/R5 water control structure.	Ponds R4/R5 water control structure.	Ponds R4/R5 water control structure.	As described for Alternatives Ravenswood B, C and D: Ponds R4/R5 water control structure.
No water control structure between Ponds R3/S5.	Ponds R3/S5 water control structure.	Ponds R3/S5 water control structure.	As described for Alternatives Ravenswood C and D: Ponds R3/S5 water control structure.
Pond R3/Ravenswood Slough water control structure.	Pond R3/Ravenswood Slough water control structure.	Pond R3/Ravenswood Slough water control structure.	As described for Alternatives Ravenswood B, C and D: Pond R3/Ravenswood Slough water control structure.
Pond S5/Flood Slough water control structure.	Pond S5/Flood Slough water control structure.	Pond S5/Flood Slough water control structure.	As described for Alternatives Ravenswood B, C and D: Pond S5/Flood Slough water control structure.
Pond R4 pilot channel.	Pond R4 pilot channel.	No Pond R4 pilot channel.	As described for Alternatives Ravenswood B and C: Pond R4 pilot channel.

Table 6-6. Comparison of Alternatives at the Ravenswood Ponds

ALTERNATIVE RAVENSWOOD B	ALTERNATIVE RAVENSWOOD C	ALTERNATIVE RAVENSWOOD D	PREFERRED ALTERNATIVE AT THE RAVENSWOOD PONDS
Pond R4 east breach.	Pond R4 east breach.	Pond R4 east breach.	As described for Alternatives Ravenswood B, C and D: Pond R4 breach. *Clarifications and Refinements: move breach to the northeast corner of the pond instead of on its eastern edge.*
No Pond R4 northwest breach.	Pond R4 northwest breach.	No Pond R4 northwest breach.	As described for Alternatives Ravenswood B and D: no breach at northwest corner of Pond R4.
Lower Pond R4 northwest levee.	Lower Pond R4 northwest levee.	Do not lower Pond R4 northwest levee.	As described for Alternatives Ravenswood B and C: lower Pond R4 levee. *Clarifications and Refinements: lower only to mean higher high water instead of mean high water.*
Ponds R5 and S5 bird habitat island.	Ponds R5 and S5 bird habitat island.	No bird habitat island Ponds R5 and S5.	As described for Alternatives Ravenswood B and C: Ponds R5 and S5 bird habitat island; add toppings to enhance it.
Viewing platform near Pond R5.	Viewing platform near Pond R5.	Viewing platform near Pond R5.	As described for Alternatives Ravenswood B, C and D: Viewing platform near Pond R5. *Clarifications and Refinements: move this platform to a location near the midpoint of the R5/S5 loop trail that would also be added.*
No additional public access trail at northwestern corner of Pond R4.	Pond R4 boardwalk trail at northwest corner.	Pond R4 trail on northwest levee.	As described for Alternative Ravenswood B: no additional public access trail at northwestern corner of Pond R4.
No Pond R4 viewing platform.	Pond R4 viewing platform.	Pond R4 viewing platform.	As described for Alternative Ravenswood B: no viewing platform at northwest corner of Pond R4.
No loop trail around Ponds R5 and S5 to connect to Bay Trail.	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail.	Complete loop trail around Ponds R5 and S5 to connect to Bay Trail.	As described for Alternatives Ravenswood C and D: complete loop trail around Ponds R5 and S5 to connect to Bay Trail. *Clarifications and Refinements: add low symbolic deterrent fencing along entire length of new trail.*

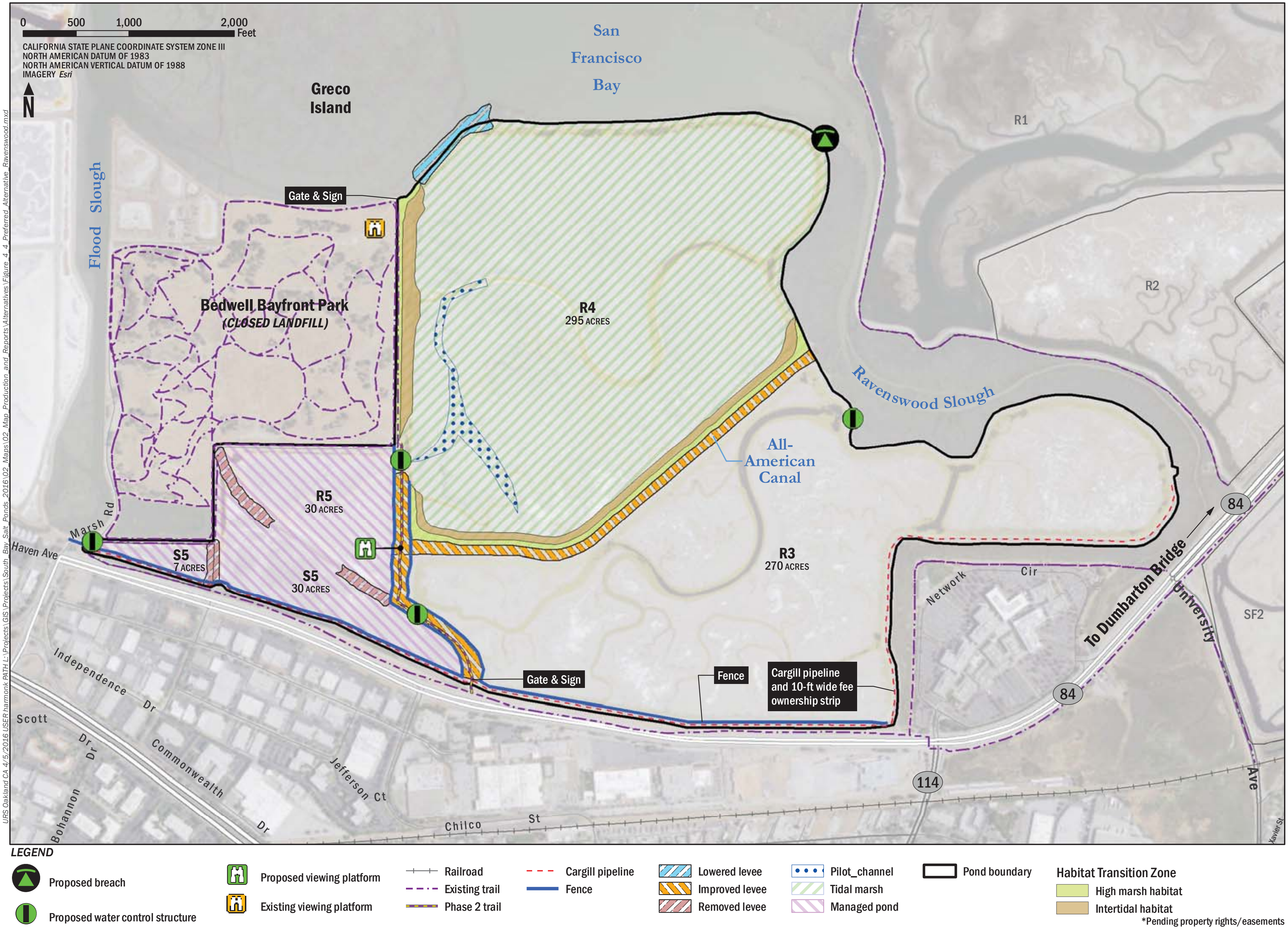

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Figure 6-4
Preferred Alternative Ravenswood Ponds

- As described in Alternatives Ravenswood C and D, the trail along the improved eastern levees of Ponds R5 and S5 would be included. Symbolic deterrent fencing and signage would be added to remind trail users to stay on the trail and out of the restoration areas on either side.
- The lowering of the levee at the northwest corner of Pond R4 was included in Alternative Ravenswood B. It would have been lowered to mean high water. Under the Preferred Alternative at the Ravenswood Ponds, it would be lowered only to mean higher high water.
- In a minor change from Alternative Ravenswood B, the proposed viewing platform would be relocated from the edge of Bedwell Bayfront Park to a new trail that would be added onto the improved eastern levees of Ponds R5 and S5.
- A second minor change to the restoration design would include the addition of sand or shell toppings to the bird habitat island that would be in the center of the R5-S5 pond group.
- The location of the breach into Pond R4 from Ravenswood Slough would be relocated from the eastern border of the pond (the location discussed for all three action alternatives) to the northeast corner of Pond R4.
- The levee improvements discussed in all three action alternatives included raising the small levees around the All-American Canal and the eastern border of Pond R5. The Preferred Alternative at Ravenswood includes an extension of those improvements along the eastern border of Pond S5 to provide more ability to separately manage water levels and quality in Ponds R3 and the combined R5/S5 managed ponds.

Several components that were included in the other action alternatives were not included because, while they may have provided one form of benefit for one resource type, they would have had larger adverse impacts on other resources. One example of this is the trail at the northwest corner of Pond R4 (considered under Alternatives Ravenswood C and D), which would have added a public access feature but would have had a greater (though still less than significant) impact on marsh-dependent wildlife species.

Habitat Transition Zones at the Ravenswood Ponds

As noted above, the Preferred Alternative would include habitat transition zones at the Ravenswood Ponds. At the request of the San Francisco Bay Regional Water Quality Control Board, **Table 6-7** presents estimates of the areas and volumes of fill of the habitat transition zones proposed for the Phase 2 action alternatives at the Ravenswood Ponds, as well as an estimation of what portion of each of them would be placed at elevations above MHHW. Fill placed to build transition zones below that tidal elevation would be converting ponds to tidal wetlands, which are another form of waters of the U.S. and of the State of California, but fill placed above that elevation would be converting waters to uplands, which has regulatory implications. The potential impacts of this fill are discussed in full in the appropriate sections of Chapter 3. These estimates are based on the material volumes presented in the preliminary design memorandum for this pond cluster (Appendix N to the Draft EIS/R) and are based on simplifying assumptions using the average pond bottom elevation. The lengths are measured along the MHHW elevation and are thus specific to this exercise; slightly different numbers are presented in Chapter 2.

Table 6-7. Estimated Dimensions of Habitat Transition Zones at the Ravenswood Ponds

HABITAT TRANSITION ZONE	LENGTH (FEET)	FOOTPRINT AREA (ACRES)	VOLUME (CUBIC YARDS)
Total Dimensions			
Bedwell Bayfront Park Habitat Transition Zone	2,500	10.5	44,600[1]
All-American Canal Habitat Transition Zone	5,200	15.7	39,400
Dimensions Above Mean Higher High Water			
Bedwell Bayfront Park Habitat Transition Zone	2,500	2.7	1,527
All-American Canal Habitat Transition Zone	5,200	5.7	3,037

[1] The habitat transition zone adjacent to Bedwell Bayfront Park has a smaller footprint than the one adjacent to the All-American Canal, but it has a greater volume because it needs to fill a very large borrow ditch and former slough channel.

Summary of Impact Analysis from Chapter 3

The Preferred Alternative at the Ravenswood Ponds is similar to Alternative Ravenswood B. The potential for adverse environmental impacts from this portion of the Preferred Alternative, as well as the expected restoration benefits, would therefore be similar to those discussed for Alternative Ravenswood B in Chapters 3-5 of the Draft EIS/R. In addition, there are more habitat enhancement and public access benefits that can be added to the Preferred Alternative from Alternatives Ravenswood C and D without creating a significant impact or requiring new mitigation measures. The significance determinations from all three action alternatives in the Draft EIS/R were either “No Impact” or “Less than Significant.” The differences are discussed in the following paragraphs.

As noted above, the Preferred Alternative adds some components from Alternatives Ravenswood C and D. These components were described in the Draft EIS/R, and their potential effects on the resources with which they would interact are expected to be very similar to the conclusions made in that document. The placement of a water control structure between Pond R3 and Pond S5 would have relatively minor marginal construction impacts but would greatly enhance the restoration benefits and allow management of water levels to give Refuge staff more ability to avoid water quality problems, algal blooms, or other adverse impacts, all of which were discussed in the Draft EIS/R.

Similarly, the habitat transition zone from the All-American Canal would bring better long-term habitat complexity and help reduce erosion of the levee behind it, thus adding to flood protection. There would be more material needed to build this second transition zone than would be needed for an unmodified Alternative Ravenswood B, but Alternative Ravenswood C included both of these two habitat transition zones, and the relevant potential impacts were still found to be less than significant. The main impacts associated with import of fill are on traffic and air quality, largely from the hauling trucks. However, these impacts were less than significant for Alternative Ravenswood C and are expected to be similar for the Preferred Alternative at Ravenswood.

The selection of Alternative Ravenswood B as the starting point for the portion of the Preferred Alternative that would be implemented at the Ravenswood Ponds enabled the entire length of the eastern levees of these two small ponds to be raised and improved between the southeast corner of Bedwell Bayfront Park and the Refuge’s southern border with the existing Bay Trail spine. This would both separate them from Pond R4 (to be restored to a tidal marsh) and Pond R3 (to be enhanced for nesting western snowy plover), as described in the action alternatives, and allow a public access trail to complete a loop around Ponds R5 and S5. This short additional segment of levee improvements would require a small increase in the volume of imported fill material, but, as was described for the Preferred Alternative at the Alviso-A8 Ponds, the maximum daily truckloads of imported fill were already assumed in the impact analysis. This additional material would mean a slightly longer construction period (both for import and placement of material) but would not create any new significant impacts.

The northern and western portions of the R5/S5 loop trail already exist in Bedwell Bayfront Park, and the southern portion of it is the Bay Trail spine just outside of the Refuge, between it and State Route 84. This loop trail would connect these two existing trails on Refuge lands. Both ends of the trail would be gated and signed as required by the USFWS for public access use of its Refuge lands. The signs would include details of the rules prohibiting dogs on Refuge lands. Both sides of the trail would include a "symbolic deterrent fence" made up of short (2-3 foot tall) posts placed approximately 10 feet apart and connected by chains to serve as a visual reminder to trail users to stay on the trail and not enter the restoration marsh or enhanced managed ponds alongside it. This is a minor design change, and there are no new significant impacts from adding it because the levee on which it would be placed would be improved as part of the Preferred Alternative.

The viewing platform previously described in all action alternatives as being alongside Pond R5 would be moved to the approximate midpoint of this new trail to keep it on Refuge property and to improve the viewers' experience by giving them close-up looks at a restoring tidal marsh in Pond R4, a shallow water managed pond in Ponds R5 and S5, and a seasonally wet Pond R3 that would be enhanced and managed for snowy plover. Since the levee on which this platform would be built was going to be improved as part of Alternative Ravenswood B, there are no new significant impacts from relocating this feature.

There would also be three minor modifications to the restoration components that were described in the action alternatives for the Ravenswood Ponds. All three of these alternatives included a breach along the eastern edge of Pond R4 to connect it with Ravenswood Slough. In the Preferred Alternative, that breach would be moved to the northeast corner of the pond to reduce the length of existing fringing marsh that would be removed to connect the pond to the slough. The size of the breach is unchanged, and it still connects the same two water bodies; this is a relatively minor design change. This change also reduces the amount of removed habitat in a marsh that is frequented by the California Ridgway's rail and the salt marsh harvest mouse, which are both special-status species. Preliminary hydrodynamic analysis indicates that the change in location would not adversely affect tidal flows in and out of the pond because there is a large, existing borrow ditch that will efficiently carry flows to the large historic slough trace that is present at the originally proposed breach location. The placement of levee material taken from the breach into the borrow ditch to form a ditch block on the opposite side of the breach would facilitate this redirection of flows. Some of the material from breaching was going to be used to generally fill borrow ditches, as described in the Draft EIS/R. The inclusion of ditch blocks is a specification of that same general concept and would introduce no new impacts. Overall, therefore, the impacts of this change would be less than those described for Alternative Ravenswood B and would bring the same types of restoration benefits.

Alternative Ravenswood B described lowering the northwest levee of Pond R4 to mean high water. In the Preferred Alternative, this levee would still be lowered, but only to mean higher high water instead of to mean high water. This would reduce the hydraulic connectivity between Pond R4 and Greco Island via West Point Slough, but it would preserve the utility of that portion of levee for roosting birds and high-tide refugia for salt marsh harvest mouse and other wildlife. The change would bring a reduced impact from construction activities relative to those presented in the Draft EIS/R because there would be less earthmoving.

Finally, the addition of sand or shell topping to the habitat island that Alternative Ravenswood B described as being left in the interior of the combined S5-R5 pond group is a very minor design specification that brings no adverse environmental impacts and would enhance the habitat quality of that island as it could be used by western snowy plovers.

This discussion demonstrates that the impacts of the portion of the Preferred Alternative that would be implemented at the Mountain View Ponds is generally similar to, but in some cases somewhat less than, that presented for Alternative Mountain View B in the earlier chapters of this EIS/R. Where its impacts would vary from those discussed in Alternative Mountain View B, they are similar to – but reduced in magnitude from – those presented for Alternative Mountain View C.

6.1.5 Significance Determinations for the Phase 2 Preferred Alternative

Table 6-8 presents the results of the significance determinations by impact for the Phase 2 Preferred Alternative. For reference, the table also presents the significance determinations made in Chapter 3 for each enumerated impact and for each action and no action alternative at each pond cluster.

The impact analysis and significance determination conducted for this Final EIS/R identified the potentially significant impacts listed below. These are those impacts that could not be reduced to a less-than-significant level, even after implementation of project-specific mitigation measures or because no appropriate project-level mitigation measures exist that would that have that effect. In these rare cases, these impacts are significant.

- Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine. One of the thresholds of significance for this impact included not providing “maximum feasible public access, consistent with the proposed project.” While the Phase 2 actions would add several new public access and recreation features at two pond clusters, others had to be removed from implementation under Phase 2 because of concerns over recreation-based impacts on sensitive wildlife species. These impacts are Potentially Significant, however, because the question of “consistent with the proposed project” cannot be answered with certainty at this time. It is possible that these features could have been implemented without disturbing wildlife, in which case the decision not to add them would have failed to achieve maximum feasible access. It is also possible that the decision was correct, and that those public access features would not have been consistent with the project goals of “wildlife-compatible recreation.” Careful monitoring under the AMP would be used to measure wildlife responses to public access features and consider their addition in future project phases, if consistent with the project.
- Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use during construction activities. These impacts are Significant and Unavoidable at the Alviso-Mountain View Ponds and at the Ravenswood Ponds, where existing parking areas, park access, and some trails would necessarily be temporarily closed during portions of the construction work. This is a matter of public safety in combination with the need to bring materials and equipment through existing city parks to reach the project ponds themselves.

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
3.2 Hydrology, Flood Management, and Infrastructure													
Phase 2 Impact 3.2-1: Increased risk of flooding that could cause injury, death, or substantial property loss.	LTS	LTS	LTS	LTS	LTS	LTS/B	LTS	LTS	LTS	LTS	LTS	LTS/B	LTS
Phase 2 Impact 3.2-2: Alter existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.2-3: Create a safety hazard for people boating in the project area.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.2-4: Potential effects from tsunami and/or seiche.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.3 Water Quality and Sediment													
Phase 2 Impact 3.3-1: Degradation of water quality due to changes in algal abundance or composition.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-2: Degradation of water quality due to low dissolved oxygen levels.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-3: Degradation of water quality due to increased methylmercury production or mobilization of mercury-contaminated sediments.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-4: Potential impacts to water quality from other contaminants.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.3-5: Potential to cause seawater intrusion of regional groundwater sources.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.4 Geology, Soils, and Seismicity													
Phase 2 Impact 3.4-1: Potential effects from settlement due to consolidation of Bay mud.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-2: Potential effects from liquefaction of soils and lateral spreading.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.4-3: Potential for ground and levee failure from fault rupture.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.4-4: Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.	LTS	LTS	LTS	NI	NI	NI	NI	LTS	NI	NI	NI	LTS	LTS
3.5 Biological Resources													
Phase 2 Impact 3.5-1: Potential reduction in numbers of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS/B	LTS	NI	LTS/B	NI	LTS	LTS/B	LTS	LTS/B
Phase 2 Impact 3.5-2: Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS/B	LTS	LTS
Phase 2 Impact 3.5-3: Potential habitat conversion impacts to western snowy plovers.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-4: Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-5: Potential reduction in the numbers of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte’s gulls) as a result of habitat loss.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-6: Potential reduction in foraging habitat for diving ducks, resulting in declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS	LTS/B	LTS
Phase 2 Impact 3.5-7: Potential reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations.	LTS	LTS	LTS	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS	LTS/B	LTS
Phase 2 Impact 3.5-8: Potential habitat conversion impacts on California least terns.	NI	NI	NI	NI	LTS	LTS	LTS	LTS	NI	LTS/B	LTS/B	LTS/B	LTS

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.5-9: Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew, and further isolation of these species' populations due to breaching activities and scour.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.5-10: Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-11: Potential construction-related loss of or disturbance to nesting pond associated birds.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-12: Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-13: Potential effects of habitat conversion and pond management on steelhead.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS	NI	LTS	NI	NI	NI	NI	LTS/B
Phase 2 Impact 3.5-14: Potential impacts to estuarine fish.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS	NI	NI	NI	LTS/B	LTS	LTS/B	LTS/B
Phase 2 Impact 3.5-15: Potential impacts to piscivorous birds.	LTS/B	LTS/B	LTS/B	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.5-16: Potential impacts to dabbling ducks.	LTS/B	LTS/B	LTS/B	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-17: Potential impacts to harbor seals.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	NI	NI	NI	NI	NI	LTS/B
Phase 2 Impact 3.5-18: Potential recreation-oriented impacts to sensitive species and their habitats.	LTS	LTS	LTS	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-19: Potential impacts to special-status plants.	NI	LTS	LTS	NI	NI	NI	NI	NI	NI	NI	NI	NI	LTS

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.5-20: Colonization of mudflats and marsh plain by non-native *Spartina* and its hybrids.	LTS	LTS	LTS	LTS	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-21: Colonization by non-native *Lepidium*.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-22: Increase in exposure of wildlife to avian botulism and other diseases.	NI	NI	NI	NI	NI	NI	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.5-23: Potential impacts to bay shrimp populations.	LTS/B	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-24: Potential impacts to jurisdictional wetlands or waters.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
Phase 2 Impact 3.5-25: Potential construction-related loss of, or disturbance to, nesting raptors (including burrowing owls).	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.6 Recreation Resources													
Phase 2 Impact 3.6-1: Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.	NI	LTS	LTS	PS	PS	LTS/B	NI	NI	PS	PS	LTS/B	LTS/B	PS
Phase 2 Impact 3.6-2: Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.6-3: Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	LTS	LTS	LTS

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.6-4: Result in substantial adverse physical impacts associated with the provision of new or physically altered park and recreational facilities, or result in the need for new or physically altered park and recreational facilities, the construction of which could cause significant environmental impacts.	NI	NI	NI	NI	LTS/B	LTS/B	NI	NI	NI	LTS	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.6-5: Result in the temporary construction-related closure of adjacent public parks or other recreation facilities, making such facilities unavailable for public use.	NI	NI	NI	NI	SU	SU	NI	NI	NI	SU	SU	SU	SU
3.7 Cultural Resources													
Phase 2 Impact 3.7-1: Potential disturbance of known or unknown cultural resources.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.7-2: Potential disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.8 Land Use and Planning													
Phase 2 Impact 3.8-1: Land use compatibility impacts.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.9 Public Health and Vector Management													
Phase 2 Impact 3.9-1: Potential increase in mosquito populations.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.10 Socioeconomics and Environmental Justice													
Phase 2 Impact 3.10-1: Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.	NI	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B
Phase 2 Impact 3.10-2: Change lifestyles and social interactions.	NI	LTS/B	LTS/B	NI	LTS/B	LTS/B	NI	LTS/B	NI	LTS/B	LTS/B	LTS/B	LTS/B

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.10-3: Effects disproportionately placed on densely populated minority and low-income communities or effects or racial composition in a community.	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE	NDE
3.11 Traffic													
Phase 2 Impact 3.11-1: Potential short-term degradation of traffic operations at intersections and streets due to construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTSM	LTSM	LTSM	LTSM
Phase 2 Impact 3.11-2: Potential long-term degradation of traffic operations at intersections and streets during operation.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.11-3: Potential increase in parking demand.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.11-4: Potential increase in wear and tear on the designated haul routes during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
3.12 Noise													
Phase 2 Impact 3.12-1: Short-term construction noise effects.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-2: Traffic-related noise impacts during construction.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-3: Traffic-related noise effects during operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-4: Potential operational noise effects from O&M activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.12-5: Potential vibration effects during construction and/or operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.13 Air Quality													
Phase 2 Impact 3.13-1: Short-term construction-generated air pollutant emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-2: Potential long-term operational air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
Phase 2 Impact 3.13-3: Potential exposure of sensitive receptors to TAC emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.13-4: Potential odor emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
3.14 Public Services													
Phase 2 Impact 3.14-1: Increased demand for fire and police protection services.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
3.15 Utilities													
Phase 2 Impact 3.15-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	NI	NI	NI	LTS
Phase 2 Impact 3.15-2: Reduced clearance between waterways and PG&E electrical transmission lines.	NI	NI	NI	NI	LTS	LTS	NI	NI	NI	NI	NI	NI	LTS
Phase 2 Impact 3.15-3: Reduced structural integrity of PG&E towers.	NI	NI	NI	LTS	LTS	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-4: Changes in water level, tidal flow and sedimentation near storm drain systems.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-5: Changes in water level, tidal flow and sedimentation near pumping facilities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.15-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Phase 2 Impact 3.15-9: Reduced access to sewer force mains due to levee construction.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Table 6-8. SBSP Restoration Project Phase 2 EIS/R Summary Impact Table

IMPACT	ALTERNATIVES												
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD				PREF ALT
	A	B	C	A	B	C	A	B	A	B	C	D	
3.16 Visual Resources													
Phase 2 Impact 3.16-1: Alter views of the SBSP Restoration Project Area.	LTS	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS/B	LTS/B	LTS/B	LTS
3.17 Greenhouse Gas Emissions													
Phase 2 Impact 3.17-1: Construction-generated GHG emissions.	NI	LTS	LTS	NI	LTS	LTS	NI	LTS	NI	LTS	LTS	LTS	LTS
Phase 2 Impact 3.17-2: Operational GHG emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Phase 2 Impact 3.17-3: Conflicts with applicable GHG emissions reduction plan, policy, or regulation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Notes:

Alternative A at each pond cluster is the No Action/No Project Alternative.

B = Beneficial; LTS = Less Than Significant; LTSM = Less Than Significant With Mitigation; NDE = No Disproportionate Effect; NI = No Impact; PS = Potentially Significant; SU = Significant and Unavoidable

The levels of significance for the impacts listed above assume that the program-level mitigation measures from the 2007 EIS/R and the elements of the Adaptive Management Plan are integral components of the Phase 2 project alternatives, and that management responses would be implemented based on ongoing monitoring and applied studies.

6.2 Environmentally Preferred Alternative

The Environmentally Preferred Alternative is defined by the Council on Environmental Quality as the alternative that best meets the criteria of Section 101(b) of NEPA (42 United States Code [USC] 4331)[1]. The environmentally preferred alternative is a NEPA term for the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment, but it also means the alternative that best protects, preserves, and enhances historical, cultural, and natural resources. The SBSP Restoration Project would provide benefits such as increased and improved tidal marshes and other habitats, additional public access and recreation opportunities, reduced risk of unplanned levee failure, and added potential for carbon sequestration. None of these benefits would be realized under the No Action Alternative.

Informed in part by the public and agency comment on the Draft EIS/R as well as ongoing monitoring and research from the Adaptive Management Plan, the USFWS has made a preliminary identification of the Environmentally Preferred Alternative. The Phase 2 Preferred Alternative is the Environmentally Preferred Alternative. As required by the regulations implementing NEPA, the USFWS will formally identify the Environmentally Preferred Alternative in its Record of Decision for Phase 2 of the project.

6.3 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6 addresses the selection of the Environmentally Superior Alternative among the alternatives proposed. That section states that, if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify an environmentally superior alternative among the other alternatives. However, as noted above, and explained in this Final EIS/R, the environmentally superior alternative is not the No Project Alternative. The SBSP Restoration Project's Phase 2 action alternatives would bring numerous benefits, none of which would be realized under the No Project Alternative.

Under the various action alternatives considered, the only potentially significant and unavoidable impacts remaining pertain to recreation and public access resources. In one of these impacts, there would be temporary closures of recreation and public access facilities during construction. In the other, the addition of less than the maximum feasible number of public access and recreation features crosses a threshold of significance established for the 2007 EIS/R. Yet even in that instance, there is still an increase in the number of public access and recreation features, but less than the maximum possible addition. These significant and unavoidable impacts would be realized under any of the action alternatives, and one of them (failure to provide maximum possible new public access features) would be realized and of greater

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[1] The environmentally preferred alternative is the alternative that will promote the national environmental policy expressed in NEPA (Sec. 101 (b)), as follows:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

magnitude even under the No Action Alternative. All other potential impacts were either non-existent or less than significant. Therefore, CEQA does not require identification of an environmentally superior alternative.

Nevertheless, informed in part by the public and agency comments received on the Draft EIS/R as well as ongoing monitoring from the Adaptive Management Plan, the SCC has made a preliminary identification of the Environmentally Superior Alternative. The Phase 2 Preferred Alternative is the Environmentally Superior Alternative. Implementing the Preferred Alternative would most effectively and efficiently meet the project goals while minimizing impacts on the natural environment, the built environment, and human communities; and also comply with environmental regulatory requirements.

7. GLOSSARY

The following glossary includes the full list of terms and definitions from the 2007 Final Environmental Impact Statement/Report (EIS/R) for the South Bay Salt Pond Restoration (SBSP) Project as well as additional terms or concepts developed for the current Final EIS/R for Phase 2.

100-year floodplain: The area adjacent to a waterbody that would be inundated during a base flood.

Archimedes' screw: A machine historically used for transferring water from a low-lying body of water into irrigation ditches.

accretion: The act of adding material, such as from the deposition and accumulation of waterborne particles.

acute toxicity: For purposes of this project, a median of less than 90 percent survival, or less than 70 percent survival more than 10 percent of the time, of test organisms in a 96-hour static or continuous flow test. See also *chronic toxicity*.

adsorption: The adherence of a gas, liquid, or dissolved material on the surface of a solid.

algae: Simple rootless plants that grow in bodies of water (e.g., estuaries) at rates dependent on sunlight, temperature and the amounts of plant nutrients (e.g., nitrogen and phosphorus) available in water.

alluvial: Relating to the deposits made by flowing water; washed away from one place and deposited in another; as, alluvial soil, mud, accumulations, deposits.

Alquist-Priolo Act: The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides.

amphibian: A cold-blooded, smooth-skinned vertebrate animal of the class Amphibia, such as a frog or salamander, that typically hatches as an aquatic larva with gills. The larva then transforms into an adult having air-breathing lungs.

amphipods: A small freshwater or marine crustacean with a thin body and without a carapace.

anadromous: Fish and invertebrates, such as shrimp, migrating from saline to freshwater to spawn.

anaerobic: Not containing oxygen or not requiring oxygen.

anoxic: Without oxygen; water that contains no dissolved oxygen.

anthropogenic: Involving the impact of humans on nature; induced, caused, or altered by the presence and activities of humans, as in water and air pollution.

aquifer: Underground rock or soil layer yielding groundwater for wells and springs, etc.

astronomic tides: The periodic rise and fall of a body of water resulting from gravitational interactions between the Sun, Moon and Earth.

atlatl: Spear-thrower.

attenuation: Reduction.

Authorized Expansion Boundary/Authorized Acquisition Boundary: In 1990, the United States Fish and Wildlife Service (USFWS) completed an Environmental Assessment and Finding of No Significant Impact (1990 EA) that evaluated potential acquisition of land to meet the Congressional purposes of establishing and expanding the San Francisco Bay National Wildlife Refuge (renamed the Don Edwards San Francisco Bay National Wildlife Refuge in 1995). The 1990 EA identified the Authorized Expansion Boundary on a map. (Both the 1990 EA and the Authorized Expansion Boundary map are presented in Appendix P of the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R [2007 EIS/R].) The vast majority of the Authorized Expansion Boundary is south of the San Mateo Bridge. Since 1990, USFWS has acquired land within the Authorized Expansion Boundary (through purchase, lease, or donation), including portions of the 15,100 acres acquired from Cargill Inc. in 2003. The Authorized Expansion Boundary has since been renamed the Approved Acquisition Boundary.

base flood: A flood having a one percent chance of being equaled or exceeded in any given year.

bathymetry: Of or relating to measurements of the depths of waterbodies, such as oceans, estuaries or lakes.

Bayfront Canal and Atherton Channel Project: A project being developed and proposed by the City of Redwood City to address a problem related to periodic flooding related to heavy storm water runoff coincident with high tides in Flood Slough, which would normally receive the runoff from the Bayfront Canal and the Atherton Channel. Redwood City would implement this project through a collaborative effort with the SBSP Restoration Project by diverting some of the peak storm water runoff into Ravenswood Ponds R5 and S5 to address conditions of high residual salinity in those ponds.

baylands: Shallow water habitats around San Francisco Bay (Bay). They include lands that are touched by tides and lands that would be tidal in the absence of man-made structures.

benthic organisms: Those organisms living at or near the bottom of a body of water.

berm: A mound or bank of earth, used especially as a barrier.

bioaccumulation: The increase in concentration of a chemical in organisms that reside in environments contaminated with low concentrations of various organic compounds. Also used to describe the progressive increase in the amount of a chemical in an organism resulting from rates of absorption of a substance in excess of its metabolism and excretion.

biosentinel: Wildlife or plant species that can be used as a primary indicator of a spatial pattern or temporal trend.

biota: The combined flora and fauna of a region.

biotic: Pertaining to life or living things, or caused by living organisms.

bittern pond: A repository of concentrated soluble salts other than sodium chloride.

bittern: Waste materials left over after common salt (sodium chloride) is harvested from salt ponds. Shown in laboratory studies to have toxic effects on aquatic life.

bog: A wetland that has poorly drained, acidic peat soil dominated by sedges and sphagnum moss.

borrow ditch: An excavated ditch adjacent to the pond levees where material was excavated in order to create and maintain the pond levees.

brackish: A mixture of fresh and saltwater typically found in estuarine areas; of intermediate salinity.

brackish water: Water containing a mixture of seawater and freshwater; contains dissolved materials in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses.

breach: An opening (especially a gap in a levee).

brines: Water containing large amounts of a salt or salts, especially sodium chloride.

buffer zone: A barrier between sensitive wildlife habitat and land uses such as agriculture or urban development. A transitional zone intended to provide for compatibility of nearby dissimilar uses.

candidate species (federal definition): A species for which the U.S. Fish and Wildlife Service has on file sufficient information to support a proposal to list the species as endangered or threatened, but for which proposed rules have not yet been issued.

candidate species (state definition): A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the California Fish and Game Commission has formally noticed as being under review by the California Department of Fish and Game for addition to either the list of endangered species or the list of threatened species, or a species for which the Commission has published a notice of proposed regulation to add the species to either list.

catadromous: Fish and invertebrates, such as shrimp, migrating from fresh to saline water to spawn.

channel density: The amount of channel habitat per acre of marshplain.

Charleston Slough: Charleston Slough is adjacent to and just west of Pond A1 in the Alviso-Mountain View pond cluster and within the Authorized Acquisition Boundary (formerly called the Authorized Expansion Boundary). Charleston Slough is owned by the City of Mountain View but is being included in a coordinated planning and implementation effort with the Phase 2 project ponds. Charleston Slough was not included in the 2007 EIR/S.

chronic toxicity: A detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. See also acute toxicity.

congeners: Elements belonging to the same group on the periodic table (e.g., sodium and potassium); compounds produced by identical synthesis reactions and procedures.

cytochemical: Related to the chemistry of cells.

datum: A base elevation used as a reference from which to reckon heights or depths.

deep water habitat: Aquatic habitats, such as in lakes, rivers and oceans, where surface water is permanent and deeper than 6.6 feet (2 meters) most of the year.

delta: A nearly flat plain of alluvial deposits between diverging branches of the mouth of a river.

demersal: Dwelling at or near the bottom of a body of water.

desalination: The removal of salt (especially from sea water).

detritus: Organic waste material from decomposing dead plants or animals.

diadromous fishes: Fishes that migrate through estuaries on their way either to freshwater or to saltwater. Includes anadromous species, which migrate from salt water to spawn in fresh water, and catadromous species, which migrate from fresh water to spawn in the ocean.

diatoms: A major group of eukaryotic algae, and one of the most common types of phytoplankton.

ditch block: A constructed blockage in a flow path, such as a borrow ditch, designed to deflect the flow of water into an alternate flow path, such as a historic marsh channel.

diurnal: Having a daily cycle.

diversity: An ecological measure of the variety of organisms present in a habitat.

donut: A circular water control structure that has multiple intakes and that is used to distribute water through a canal and siphon system.

ebb tide: The tide defined when the movement of the tidal current is away from the shore or down a tidal river or estuary.

ecology: The study of the interactions between living things and their environment.

ecosystem: A basic functional unit of nature comprising both organisms and their nonliving environment, intimately linked by a variety of biological, chemical, and physical processes.

ecotone: A transition zone between two ecosystems; referred to as *habitat transition zone* in the Final EIS/R.

endangered (federal definition): Any species which is in danger of extinction throughout all or a significant portion of its range.

endangered (state definition): A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

essential fish habitat: Waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

estuarine: Of, relating to, or found in an estuary.

estuary: The wide part of a river where it nears the sea; where fresh- and saltwater mix in a semi-enclosed body of water.

eustatic sea level: The global sea level, effected by changes due to glacial melting or formation, thermal expansion or contraction of sea water, etc.

eutrophication: Having waters rich in mineral and organic nutrients that promote a proliferation of plant life, especially algae, which reduces the dissolved oxygen content and often causes the extinction of other organisms.

exotic species: Any introduced plant or animal species that is not native to the area and that may be considered a nuisance (e.g., Norway rat, Spartina, etc.). See also invasive species.

fauna: Animals, especially the animals of a particular region or period, considered as a group.

floodplain: An area adjacent to a lake, stream, ocean or other body of water lying outside the ordinary banks of the water body and periodically filled by flood flows. Often referred to as the area likely to be filled by the 100-year flood (base flood).

flora: Plants considered as a group, especially the plants of a particular country, region, or time. fluvial flooding: Results when river, stream or creek discharges overtop their banks and result in the inundation of adjacent lands.

geomorphic: Pertaining to the shape or surface of the earth, including small-scale changes in land surface resulting from restoration projects.

geotechnical: A science that deals with the application of geology to engineering.

ground lurching: The horizontal movement of ground located adjacent to slope faces during strong, earthquake-induced ground motion.

groundwater: Water that penetrates the earth's surface from precipitation and from infiltration from streams; water present below ground from ponds and lakes; water that flows or ponds underground.

habitat: The range of environmental factors at a particular location supporting specific plant and animal communities.

habitat transition zone: High marsh, or ecotone, where species frequently occur above the high tide line; indicated by wrack material (water-transported organic and synthetic detritus); a transitional habitat from marsh to upland or other habitat. A habitat transition zone is sometimes also referred to as an upland transition zone, transition zone habitat, ecotone, or horizontal levee; this document uses "habitat transition zone" for this constructed feature.

halophyte: Salt-tolerant vegetation.

halophytic: having the characteristics of a hylophyte (salt-tolerant) plant.

hazardous air pollutant: The classification, under federal law, for a pollutant that increases the public's risk of developing cancer. See also toxic air contaminant.

hemiparasitic: Partially dependent on another host plant in order to survive.

histopathological: Pertaining to the tissue changes that affect a part or accompany a disease.

hydraulic: Of or involving a fluid, especially water, under pressure.

hydrodynamics: Deals with the motion of fluids.

hydrographic: The scientific description and analysis of the physical conditions, boundaries, flow, and related characteristics of the earth's surface waters.

hydrology: The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

hygroscopic: Describing a chemical substance with an affinity for water, one that will absorb moisture, usually from the air.

hypersaline: Marked by increased salt in a saline solution. Applies to highly saline brines, typically several times as salty as seawater.

hypoxic: Refers to natural waters that have a low concentration of dissolved oxygen (≤2 milligrams per liter as compared with a normal level of 8–10 milligrams per liter).

igneous: Said of a rock or mineral that solidified from molten or partially molten material, i.e., from a magma.

infauna: Aquatic animals that live in the substrate of a body of water, especially in a soft sea bottom.

intermittent stream: A stream filled with water for only a portion of the year.

interstitial: Pertaining to the interstices, or small spaces between adjacent objects.

intertidal habitat: The tidal area between the mean lower low water (MLLW) and mean higher high water (MHHW) which is alternately exposed and covered by water twice daily.

intertidal mudflats: The habitat zone that is generally found between MLLW and approximately one foot above local mean sea level and that lacks vascular plants.

inundation: Covered by a flood.

invasive species: A species that is 1) non-native (exotic) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

invertebrate: A animal without a backbone.

jurisdictional wetlands: Wetlands which meet the criteria of “waters of the United States” and are thereby under the jurisdiction of the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. The definition developed by the Corps of Engineers considers as wetlands those areas which “...are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Under this definition, all three of the following conditions must be present: a) a dominance of wetland plants; b) hydric soils (soils with low oxygen concentrations in the upper layers during the growing season); and c) wetlands hydrology.

lagoon: A coastal body of water separated from the ocean by a sand bar, which may periodically breach, opening the lagoon to the ocean for a time. Lagoons can form where a river meets the ocean (an estuarine lagoon), or without the influence of a river.

larvicide: Control agent that targets the larval portion of the life cycle, as used in the control of mosquitoes.

lateral and vertical tectonic displacement: The large scale horizontal and vertical movement of the Earth's crust due to structural plate interaction.

lateral spreading: The horizontal displacement of soil during strong, earthquake-induced ground motion.

levee: A barrier constructed to contain the flow of water, prevent flooding, or to keep out the sea.

liquefaction: see "soil liquefaction".

lower tidal marsh: Habitat that occurs above mudflats along stream and slough channels and typically is found between mean tide level and mean high water (3.3-5.5 feet National Annual Vertical Datum 88). Within the range of daily tidal fluctuations; ground surface and low-growing plants are exposed at low tides and completely inundated at higher tides and during periods of high stream discharge.

mammal: Any of various warm-blooded vertebrate animals of the class Mammalia, including humans, characterized by a covering of hair on the skin and, in the female, milk-producing mammary glands for nourishing the young.

managed ponds: Diked wetland, generally shallow open water habitats.

marsh: A common term applied to describe treeless wetlands characterized by shallow water and abundant emergent, floating, and submerged wetland flora. Typically found in shallow basins, on lake margins, along low gradient rivers, and in calm tidal areas. Marshes may be fresh, brackish or saline, depending on their water source(s).

marsh panne: Marsh pannes are topographic depressions on mature tidal marsh plains. They are most common in areas most distant from any tidal source and exist on drainage divides between channel networks, and on the backsides of natural levees. Marsh pannes range in age from less than 50 years to more than 1,500 years.

mean sea level: The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. metamorphic rock: Any rock derived from pre-existing rocks by mineralogical, chemical, and/or structural changes, essentially in the solid state, in response to marked changes in temperature, pressure, shearing stress, and chemical environment, generally at depth in the earth's crust.

methylation: Conversion of sediment-bound mercury may through both biotic and abiotic processes to its more bioavailable methylated form. Methyl mercury has known neurological toxicity effects that tend to increase at each level up the food chain in aquatic environments. Thus, the availability of such contaminants, even in the seemingly insignificant parts per trillion range, often are ecologically important.

MHHW: Mean Higher High Water, the average height of the higher of the two daily high tides.

MHW: Mean High Water, the average height of all the high tides.

microtidal marsh: A tidal marsh that receives less than full tidal flow because of a physical impediment. Muting can result from the presence of natural formations such as a sand bar or of human-made structures such as tide gates, culverts, or other water control structures. Muted tidal marshes exhibit many of the same features of fully tidal marshes, although they frequently lack the same range of plant diversity.

middle tidal marsh: Habitat that occurs between mean high water and mean high higher water (5.5- 6.0 feet National Annual Vertical Datum 88); inundated only during higher high tides.

migratory: Moving regularly or occasionally from one region or climate to another; as, migratory birds.

MLLW: Mean Lower Low Water, the average height of the lower of the two daily low tides.

MLW: Mean Low Water, the average height of all low water heights.

morphology: That branch of biology which deals with the structure of animals and plants.

MTL: Mean Tide Level.

mudflat: Flat un-vegetated wetlands subject to periodic flooding and minor wave action. The area, which lies between tidal marshes and the edge of the Bay at low tide, provides habitat for invertebrates, fish, and shorebirds.

mutagenicity: The capacity to induce a mutation or an abrupt change in the genetic constitution of an organism.

muted tidal marsh: A tidal marsh that receives less than full tidal flow because of a physical impediment. Muting can result from the presence of natural formations such as a sand bar or of human-made structures such as tide gates, culverts, or other water control structures that reduce the range of the tides but still allow for frequent inundation. Muted tidal marshes exhibit many of the same features of fully tidal marshes, although they frequently lack the same range of plant diversity. Also referred to as damped tidal marsh (see also microtidal marsh).

native species: Species which have lived in a particular region or area for an extended period of time.

navigation channel: The buoyed, dredged, and policed waterway through which ships proceed, especially in general shallow areas.

neap tides: The tides resulting when the sun and moon are at right angles to each other, characterized by a reduced tidal range.

nonattainment areas: Areas that do not meet the national ambient air quality standards established in 1970 by the Clean Air Act.

nonpoint source: A diffuse source of pollution that cannot be attributed to a clearly identifiable, specific physical location or a defined discharge channel. This includes the nutrients that run off the ground from any land use (e.g., croplands, feedlots, lawns, parking lots, streets, forests, etc.) and enter waterways. It also includes nutrients that enter through air pollution, through the groundwater, or from septic systems.

nutrient load: Quantity of plant nutrients added to a given area (e.g., a pond).

obligates: Obligate wetland plant species. Wetland indicator species are designated according to their frequency of occurrence in wetlands. Obligate and facultative wetland indicator species are hydrophytes that occur “in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present” (Environmental Laboratory 1987).

organoarsenical: Of, relating to, or being an organic compound that contains arsenic.

outfall: The place where a sewer, drain, or stream discharges.

oxidant: An oxidizing agent.

pannes: See salt pannes.

pelagic: Referring to the open sea at all depths.

peripheral halophytes: Plants adapted to living in a saline environment. Peripheral halophytes occur along the banks and tops of levees separating tidal areas from salt ponds, and occasionally along levees separating salt ponds from each other.

permeability: The degree to which something (e.g., an earthen structure) can be penetrated by a liquid.

pH: Measure of the acidity or alkalinity (basicity) of water (pH 7 is neutral, increasing values indicate alkalinity and decreasing value indicate acidity).

phytoplankton: Small (often microscopic) aquatic plants suspended in water.

piecemealing: An unacceptable practice in which projects are analyzed incrementally by parts to make the environmental impacts appear smaller to the overseeing agencies.

piscivorous: Fish-eating.

point source: A source of pollution that can be attributed to a specific physical location; an identifiable, end of pipe "point." The vast majority of point source discharges of plant nutrients are from wastewater treatment plants, although some come from industries.

point-source discharge: A discharge of a pollutant from an identifiable point, such as a pipe, ditch, channel, sewer, tunnel, or container.

pond complex: A group of salt ponds being treating as a unit for planning purposes.

ppt: Parts per thousand (used as a measurement of salinity); the salinity of ocean water is approximately 35 ppt.

proposed species of concern (federal definition): A group of organisms for which a general notice has been published in a local newspaper and a proposed rule for listing has been published in the Federal Register. A species that may or may not be listed in the future (formerly "C2 candidate species" or "species under consideration for listing for which there is insufficient information to support listing").

rare (state definition): A species, subspecies, or variety is rare when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens.

restoration: The return of an ecosystem to a close approximation of its condition prior to disturbance.

riparian area: Riparian refers to the area of land adjacent to a body of water, stream, river, marsh, or shoreline, forming a transition between the aquatic and the terrestrial environment.

riprap: Large rock or other material often used to stabilize streambanks or erosive shorelines.

ruderal: Disturbed habitat usually of poor quality.

saline wedge: Viscous, dense brine that forms in the siphon when the denser, heavier saline water falls to the bottom of the siphon and blocks the passage of water.

salina: Natural impoundment of tidal water less than 30 cm deep on the high marsh plain. They tend to be longer than wide, and to parallel the extreme high tide contour.

saline: Of, relating to, or containing salt; salty.

salinity: A measure of the salt concentration of water; higher salinity means more dissolved salts.

salt marsh: A coastal habitat consisting of salt-resistant plants residing in an organic-rich sediment.

salt pannes: Salt pannes are shallow, generally unvegetated areas that form shallow ponds on the salt marsh. They become hypersaline in late summer. Salt pannes often contain fish populations and provide valuable habitat for shorebirds when flooded.

salt ponds: Commercial facilities that extract salt from Bay water by evaporation. Algae are the main vegetation, brine shrimp and birds the primary inhabitants.

sand boil: Sand and water ejected to the ground surface as a result of liquefaction at shallow depth; the conical sediment deposit that remains as evidence of liquefaction

sausal: Sausals (termed by Spanish explorers) are groves of willows on flat lands, often associated with creeks that are sustained by springs, seeps, or a shallow water table.

seasonal wetlands: Shallow depressions that typically contain standing water during the rainy season but become drier, or dry out, in summer and fall. They include diked (formerly tidal) salt and brackish marshes, farmed wetlands, abandoned salt ponds, inland freshwater marshes and vernal pools.

sediment budget: An accounting of all sediment delivery, export, and storage.

sedimentation: The deposition or accumulation of sediment.

semidiurnal: Occurring twice each day.

sensitive receptors: For impacts related primarily to noise or air quality, sensitive receptors are those facilities that typically host people or communities that are more susceptible to adverse environmental impacts. For air quality impacts, for example, these include schools, churches, residences, apartments, hospitals, licensed day care facilities, elderly care facilities, etc.

sensitive species (federal definition): Those plant and animal species identified by a regional forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

sessile: Sitting directly on base without support, stalk, pedicel, or peduncle; attached or stationary as opposed to free living, or exhibiting or capable of movement.

slough: A narrow, winding waterway edged with marshy and muddy ground. These water bodies are distinguished by low flow or stagnant waters.

soil liquefaction: The sudden and total loss of soil strength during earthquake-induced ground motion. Occurs in loose, saturated, clean sand where ground shaking increases effective pore pressure resulting in the displacement of individual sand grains and groundwater. The soil transforms into a fluid-like state, allowing displacement of water and the potential mobilization of sand if not confined.

Spartina (alterniflora): Smooth cordgrass, an invasive species.

special status species: Collective term for endangered species, threatened species, species of concern and species of special concern.

species of concern (federal definition): An informal term that refers to those species which USFWS

believes might be in need of concentrated conservation actions. (Formerly known as Category 1 or 2 Candidate).

species of special concern (state definition): Native species or subspecies that have become vulnerable to extinction because of declining population levels, limited ranges, or rarity. The goal is to prevent these animals and plants from becoming endangered by addressing the issues of concern early enough to secure long term viability for these species.

specific yield: A measure of aquifer productivity; the volume of water drained divided by the total volume of the sample.

spring tides: The tides resulting when the gravitational forces exerted on the earth by the sun and moon are acting in the same direction.

staircase issue: A staircase issue is an area of uncertainty for which it is difficult to predict specific outcomes based on the available data and current understandings of the system. Staircase issues are being addressed through the Adaptive Management Plan (AMP), which includes monitoring to measure and track actual outcomes of management and restoration actions, together with predefined triggers designed to detect adverse outcomes early on, before they reach levels of significance. Corrective actions can thus be developed and implemented before the thresholds of significance are reached. If monitoring indicates that no adverse impacts are occurring, then the planned restoration can continue along the staircase to the next step. The “restoration staircase” was a concept developed for the South Bay Salt Pond Restoration Project at its program level and was included in the 2007 EIS/R.

stillwater flood elevation: Projected elevation that flood waters would assume in the absence of waves resulting from wind or seismic effects.

streambed: A channel occupied (or formerly occupied) by a stream.

strike slip fault: A fault on which the movement is parallel to the fault’s strike (the direction taken by a structural surface, e.g., a bedding or fault plane, as it intersects the horizontal).

submerged plants: Plants growing with their root, stems, and leaves completely under the surface of the water.

submerged: Below water.

subsidence: The motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea level.

subtidal habitat: Areas below mean lower low water (MLLW) that are covered by water most of the time.

swamp: A seasonally flooded bottomland with more woody plants than a marsh and better drainage than a bog.

tectonically: Pertaining to the forces involved in, or the resulting structures of geology dealing with the broad architecture of the outer part of the earth, that is, the major structural or deformational features and their relations, origin, and historical evolution.

teratogenicity: The capacity to cause birth defects.

tertiary wastewater treatment: Selected biological, physical, and chemical separation processes to remove organic and inorganic substances that resist conventional treatment processes; the additional treatment of effluent beyond that of primary and secondary treatment methods to obtain a very high quality of effluent.

threatened (federal definition): Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

threatened (state definition): A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts.

tidal dispersion: The transportation of a water parcel resulting from the spatial and temporal variability in the speed and direction of tidal currents.

tidal excursion: The horizontal distance a particle or water parcel travels during a single flood or ebb tide.

tidal marsh: Wetlands with fresh water, brackish water, or salt water along tidal shores.

tidal marsh corridor: A continuous band of tidal marsh.

tidal mud flat: The unvegetated shoreline area exposed to air during low tide.

tidal muting: The restriction of tidal flow by friction; contributes to channel shape and form as a result of erosion and sedimentation.

tidal prism: The volume of water that flows into and out of a marsh.

topography: The general configuration of a land surface, including its relief and the position of its natural and man-made features.

Total Maximum Daily Load program: A quantitative assessment, provided for in the Clean Water Act, of a problem that affects water quality. Establishes the amount of a pollutant present in a water body and specifies an allowable load of the pollutant from individual sources to ensure compliance with water quality standards.

toxic air contaminant: The classification, under California law, for a pollutant that increases the public's risk of developing cancer. See also hazardous air pollutant.

toxic: The property of being poisonous, of causing death or severe temporary or permanent damage to an organism.

toxicity: The degree to which a substance is toxic.

trophic level: Stage in a food chain or web leading from primary producers (lowest trophic level) through herbivores to primary and secondary carnivores (consumers—highest level).

tsunami: A seismically induced flood caused by the transfer of energy from an earthquake epicenter to coastal areas by ocean waves.

turbidity: The relative clarity of water, which depends in part on the material in suspension in the water.

upland: Ground elevated above the lowlands along rivers or shorelines.

upper tidal marsh: Habitat that occurs from mean high higher water and up several feet (>6.0 feet National Annual Vertical Datum 88) to the maximum elevation of tidal effects. This habitat is inundated only during higher high tides.

upland transition zone: High marsh, or ecotone, where species frequently occur above the high tide line; indicated by wrack material (water-transported organic and synthetic detritus); referred to as *habitat transition zone* in the Final EIS/R.

vascular plant: Green plant having a vascular system: ferns, gymnosperms, angiosperms.

vector: An insect or other organism that transmits a pathogenic fungus, virus, bacterium, etc.

watershed: An area of land where all of the ground water and surface water drains to the same water body (typically a river or creek).

zooplankton: Floating and free-swimming invertebrates that are suspended in the water column.

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5.0 Other NEPA and CEQA Considerations

No references.

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9.4 Principal Preparers

Responsibility for preparation of this Final EIS/R rests with the lead agencies for the SBSP Restoration Project, Phase 2: USFWS, the joint lead federal agency under NEPA; and SCC, the state lead agency under CEQA.

Listed below are the employees of the consulting firms involved in preparation of this Final EIS/R, including their qualifications (educational degree, area of expertise, and years of experience in their profession).

9.4.1 URS / AECOM

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Deborah Fournier, Word Processor. 46 years of experience. Provided word processing.

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9.4.2 Moffat and Nichol Engineers

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9.4.3 Questa Environmental Consulting

Jeff Peters, M.S., Environmental Resources and Restoration. 40 years of experience. Prepared the recreational resources section and appendix.

Margaret Henderson, LLA, BSLA. 24 years of experience. Prepared the recreational resources section and appendix

9.4.4 Ducks Unlimited

Steve Carroll, P.E., B.S., Environmental Engineering. 24 years of experience. Provided technical review of design alternatives; prepared means and methods/constructability analysis.

9.4.5 LifeScience! Inc.

Lisa Stallings, PhD, Soils and Plant Science. 20 years of experience. Provided information on beneficial reuse of upland fill material

9.4.6 Bay Metrics

Alex Choi, P.E., B.S., Civil Engineering. 25 years of experience. Collected traffic count data.

10. DISTRIBUTION LIST

All persons, agencies, and organizations listed in this chapter have been informed of the availability of, and locations for obtaining, the Final EIS/R, as well as the timing of the public review and comment period. Notice of Availability of the Final EIS/R has been included in the Federal Register. Additional local elected officials and agency representatives and all others on the SBSP Restoration Project's constantly updated email list (approximately 1,700 contacts) have been sent a notification that includes information about how to access the Final EIS/R; the timing of the formal comment period; and public hearing date, time, and location.

U.S. Elected Officials

Congresswoman Anna Eshoo
Congressman Michael Honda
Congresswoman Jackie Speier
Senator Barbara Boxer
Senator Dianne Feinstein

Federal Agencies

Army Corps of Engineers, Headquarters
Army Corps of Engineers, San Francisco District
Army Corps of Engineers, South Pacific Division
Environmental Protection Agency, Region 9
NASA Ames Research Center
National Oceanic and Atmospheric Administration – Fisheries
U.S. Fish and Wildlife Service

California State Elected Officials

Assemblymember Richard S. Gordon
Senator Bob Wieckowski
Senator Jerry Hill

Local Elected Officials

Supervisor Dave Cortese
Supervisor Scott Haggerty
Supervisor Joe Simitian
Supervisor Richard Valle

State Agencies

California Air Resources Board
Bay Area Air Quality Management District
Delta Protection Commission
Department of Conservation
Department of Fish and Wildlife

Department of Parks and Recreation
Department of Toxic Substances Control
Department of Transportation
Department of Water Resources
Native American Heritage Commission
Natural Resources Agency
Office of Emergency Services
Office of Historic Preservation
San Francisco Bay Conservation and Development Commission
San Francisco Bay Regional Water Quality Control Board
State Coastal Conservancy
State Lands Commission
State Parks, Division of Boating and Waterways

Local Agencies

Alameda County Board of Supervisors
Alameda County Community Development District
Alameda County Flood Control and Water Conservation District
Alameda County Mosquito Abatement District
Alameda County Vector Control Services District
Alameda County Water District
Association of Bay Area Governments
City of East Palo Alto
City of Fremont
City of Menlo Park
City of Milpitas
City of Mountain View
City of Newark
City of Palo Alto
City of Redwood City
City of Santa Clara
City of Sunnyvale
City of Sunnyvale, Water Pollution Control Plant
City of San Jose
City of San Jose Housing Department
Port of Redwood City
San Francisquito Creek Joint Powers Authority
San Mateo County Board of Supervisors
San Mateo County Mosquito & Vector Control District
San Mateo County Planning & Building
San Mateo County Resource Conservation District
Santa Clara County Board of Supervisors
Santa Clara County Planning Office
Santa Clara County Vector Control District
Santa Clara Valley Water District

Native American Tribal Entities

Native American Heritage Commission
Gabrieleno/Tongva Tribe
Ohlone Indian Tribe

Non-Governmental Organizations, Universities, Businesses, and Individuals

The SBSP Restoration Project keeps an email list of individuals, businesses, colleges & universities, non-governmental organizations, and other stakeholders and interested parties. The full list was presented in the 2007 EIS/R, but it is continually maintained and updated. The approximately 1,700 individuals businesses, NGOs, and other entities on the current email list received notice that the Final EIS/R was available. That email included instructions on where physical, printed copies of the document could be viewed and of how electronic versions could be obtained.

Libraries

Alviso Branch Library
Biblioteca Latino America
California State University Library
Fremont Main Library
Hayward Public Library
Menlo Park Library
Mountain View Library
Rinconada Library
King Library
Redwood City Main Library
San Mateo County East Palo Alto Library
Santa Clara County Milipitas Library
Santa Clara Public Library
Sunnyvale Public Library
Natural Resources Library

Media

ANG Newspapers
Asian Week
Alameda Times
Bay Nature Magazine
BayCrossings
Contra Costa Times
Daily Review
East County Times
ESTUARY
Fremont Argus
KGO-TV
KQED-FM 88.5
KRON-CHANNEL 4

KTEH
Los Angeles Times
Marin Independent Journal
Montclarion
Oakland Tribune
Pacific Sun
Palo Alto Daily News
Palo Alto Online
Pelican Media
Sacramento Bee
San Francisco Chronicle
San Jose Mercury News
San Mateo County Times
San Ramon Times
Santa Rosa Press Democrat
The Almanac
Vallejo Times-Herald
Wall Street Journal

MITIGATION MONITORING AND REPORTING PROGRAM

The Mitigation Monitoring and Reporting Program (MMRP) for the SBSP Restoration Project Phase 2 includes the one mitigation measure identified in the SBSP Restoration Project Phase 2 Final EIS/R that would be implemented to reduce adverse environmental impacts to traffic resulting from Phase 2 actions.

As discussed in Chapter 3 of this Final EIS/R, program-level mitigation measures identified in the 2007 SBSP Restoration Project Final EIS/R would reduce impacts associated with the long-term restoration plan and have been incorporated into Phase 2 actions. These program-level mitigation measures, along with Phase 1 mitigation measures, are presented in Chapter 3 of the 2007 SBSP Restoration Project Final EIS/R and are not repeated herein.

Section 3.11 of this SBSP Restoration Project Phase 2 Final EIS/R provides further information regarding the mitigation measure identified for the Phase 2 project. The Executive Summary of this Final EIS/R also summarizes impacts and the one project-level mitigation measure identified in the EIS/R.

Mitigation Monitoring and Reporting Program Table

MITIGATION MEASURE	IMPLEMENTATION AND REPORTING ACTIONS	MONITORING RESPONSIBILITY	TIMING	COMPLETION DATE	APPROVED BY
3.11 Traffic					
Phase 2 Impact 3.11-1: Potential short-term degradation of traffic operations at intersections and streets due to construction.					
Phase 2 Mitigation Measure 3.11-1: Modify Signal Timing The landowner (USFWS) shall coordinate with Caltrans and/or the City of Menlo Park to modify the intersection signal timing in the a.m. to reduce project-related delay to a level that the City does not deem significant.	1. Assess signal timing changes required to maintain adequate intersection LOS	1. USFWS, Caltrans or its contractors	1. Prior to construction		
	2. Caltrans or its contractor implements modifications to signal timing	2. Caltrans or its contractors	2. During construction		
	3. Monitor intersection to ensure adequate LOS	3. USFWS or its contractors	3. Throughout construction		