

APPENDICES

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APPENDIX A – PLANNING CONSIDERATIONS

The Planning Considerations (considerations) summarized below were developed to help guide the location of specific habitat restoration, flood management, and public access / recreation elements within the landscape and within each pond complex. Note that there can be linkages or, in some cases, conflicts between considerations. Because trade-offs must often be made between desirable land uses, the considerations guide, but don't dictate, a particular layout of the design features.

Managed Pond Habitat		
Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Preserve and enhance managed ponds near interpretive opportunities	Protect cultural resources and provide public access routes on maintained pond levees	For example, locate managed ponds near historic salt works (<i>e.g.</i> , ponds E12 and E13)
Consider moderately subsided ponds with bottoms near mean tide elevations as the best candidates for managed ponds	Moderately subsided ponds are the least expensive to manage because flow in and out of the ponds can be accomplished by gravity drainage. No/minimal pumping is required.	Locate ponds with bottoms near mean tide elevations
Create managed pond habitat in accessible areas	Provides the easiest operations and maintenance access.	Locate managed ponds landward of the restored tidal habitat and within a complex, generally group managed ponds together
Avoid grouping managed pond habitat in only one part of the project area	Reduces the travel distance by waterbirds that use both pond and tidal habitats.	Locate managed ponds throughout the project area (<i>i.e.</i> , in all three complexes), considering the distance between managed ponds
Widely disperse ponds that are to be managed for breeding habitat	Reduces predation and competition between colonies.	Locate ponds designated for breeding habitat throughout the project area (<i>i.e.</i> , in all three complexes), considering the distance between similarly managed ponds
Restore managed ponds in areas with relatively less adjacent managed pond habitat	Provides a more even distribution of pond habitat	Locate managed ponds in areas with less adjacent (outside the project area) managed pond habitat

Tidal Habitat		
Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Create a tidal marsh corridor	Provides connectivity of habitat for salt marsh dependent species, particularly the salt marsh harvest mouse (high marsh habitat).	Create a continuous band of tidal marsh along the Bay.
Create broad upland transitional areas	Provides high tide refuge for the salt marsh harvest mouse, and provides necessary habitat for the growth and survival of special-status plants.	Conduct tidal restoration in areas where there are opportunities to create a natural transition from marsh to upland habitat. Upland transition can also be created along levees by constructing broad, gently sloping outboard levee sides.
Restore tidal action to high elevation ponds	Provides habitat quickly for marsh dependent species. This does not mean that only high elevation are appropriate for tidal restoration, but that relatively quick restoration of tidal marsh in some areas may be important on the landscape-scale, and for protection of existing populations.	Conduct tidal restoration in ponds that are only slightly subsided – with pond bottoms above approximately mean tide level
Restore tidal marshes adjacent to anadromous fish migration corridors	Provides habitat for anadromous fish; provides benefits for harbor seals by enlarging and deepening the major sloughs; complements the flood management planning considerations	Conduct tidal restoration in ponds adjacent to major sloughs that serve as fish migration corridors
Reconnect historic tidal channels with extensive intact drainage systems	Rapidly establishes multi-order channel systems.	Conduct tidal restoration in areas with intact relic drainage systems.
Create large marsh systems where possible	Provides opportunity for establishment of complex/high-order drainages; isolates broad areas from human disturbance and predator access; and provides habitat to support larger populations of salt marsh harvest mice in case connectivity is interrupted by future marsh loss due to sediment deficits or sea level rise.	Conduct tidal restoration in large contiguous areas

Tidal Habitat		
Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Incorporate unmanaged ponds and salt pans into salt marsh areas	Provides benefits to waterbirds, mimics historical marsh conditions, and is naturally self-sustaining. Mosquito control may be necessary in these areas.	Although the majority of these features will evolve gradually through natural processes, their development may be expedited by excavation of shallow basins in the upper marsh and/or along drainage divides.

Flood Management		
Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Improve flood management at the mouths of major creeks that currently experience flooding or are otherwise undersized	Improves flood management and lessen flooding risks upstream	Conduct tidal restoration adjacent to the following major sloughs and channels in order to encourage channel scour and enlargement to increase conveyance: Alameda Flood Control Channel, Old Alameda Creek, Stevens Creek, Permanente Creek, Sunnyvale West and East Channels, Guadalupe Slough, and Alviso Slough (Guadalupe River). Coyote Creek currently has adequate flood protection in the lower reaches. Flood management projects currently planned for upstream reaches may increase downstream flows in the future, requiring subsequent improvement in the lower sections. Although Alviso Slough also currently has adequate flood protection with the Pond A8 overflow in place, it is considered advantageous to encourage channel scour and enlargement to increase conveyance.
Integrate with existing and currently planned flood protection projects.	Planning and placement of the flood protection levees will take into consideration existing and proposed flood management systems.	Where feasible, proposed levees will be integrated into the existing levee alignment.
Locate levees for improved coastal flood protection	Final flood control levee alignments will be selected based on engineering feasibility, land ownership, construction and maintenance costs and compatibility with the restoration and public access plan. The detailed alignment will occur in subsequent project design phases, rather than through the alternatives development process.	In most cases, coastal flood control levees will be located along the landward edge of the project site. In isolated locations, the preferred location may be closer to the bay to protect a particular facility. At some locations the levee alignment is likely to be outside the SBSP boundary. At the program level, alternatives include the potential for variations in levee alignments to protect a given reach of shoreline.

Public Access and Recreation		
Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Provide options to cluster access and associated facilities	Reduce habitat encroachment and associated human disturbance to wildlife	Locate opportunities to cluster access
Allow for a range of options to complete the Bay Trail	Completion of the Bay Trail Spine	For example, use inboard levees and/or rail corridor right of way
Provide public access such as trails and staging areas that can be integrated with historic and cultural features	Allows for interpretive and educational components associated with points of interest.	Locate historic and cultural features
Integrate public access (trails) with flood control structures (levees) and other infrastructure such as PG&E access points where appropriate	Simultaneously satisfies multiple objectives, reduces the creation of separate trail corridors and reduces infrastructure costs.	Locate flood control levees relative to desirable access points and trail locations
Allow for a variety of different and high quality user experiences	Provides a mixture of access possibilities.	For example, access at different locations, trails with varying lengths, and access to the Bay.
Integrate public access and recreation with existing access opportunities	Expand and enhance existing public access and recreation opportunities	For example, integrate with existing trail segments and other recreational facilities on adjacent parks and open space parcels.
Consider the location and amount of public access features to provide the highest quality visitor experience	Provide visitor with a high quality, memorable experience of the landscape	All areas
Attempt to provide shorter distance opportunities and longer distance access	Provides opportunities for visitors with varying abilities	Short spur tails off of Bay Trail spine and longer trails to the Bay.
Consider operations and maintenance requirements, costs and opportunities for partnerships to implement and operate public access features	Consider and minimize ongoing costs.	All areas

Public Access and Recreation

Consideration	Purpose / Rationale	How and Where to Achieve within the Project Area
Consider location and siting of features to reduce conflicts and impacts of visitors to the adjacent habitats (provide buffers, seasonal access, visitor restrictions, etc)	Reduce habitat disturbance	All areas
Ensure that Phase 1 projects can dovetail well with long term alternatives implementation	Eliminate the need to remove facilities as new restoration phases are implemented	All areas

APPENDIX B – CHANGES BETWEEN THE PRELIMINARY AND FINAL ALTERNATIVES

The preliminary alternatives presented in the Preliminary Program Alternatives Memorandum (PWA and others 2005) have changed in response to changes in the overall alternatives approach, the availability of new information, results of preliminary assessments, and comments received on the preliminary alternatives from the landowners and the USFWS Endangered Species Program, Project workshops. These changes are reflected in the final alternatives presented in this report, and are summarized below.

1. Alternatives Approach

The final alternatives represent a range that responds to the project objectives, with each alternative representing a potential “end-state” at year 50. These end-states are evaluated as “bookends,” representing a range of outcomes from a 50:50 ratio of tidal to managed-pond habitat (Alternative B), to a 90:10 ratio (Alternative C). The preliminary results from the Landscape-Scale Assessment support the bookends as viable options in terms of relying on natural sedimentation to create tidal marsh in the subsided pond, including the deeply subsided Alviso ponds. However, adaptive management will be an integral part of the planning and implementation process to guide selection of the ultimate endpoint, and the optimum configuration may very well be a solution between these two bookends.

Previously, an alternative was presented that represented a 75:25 ratio of tidal to managed-pond habitat (formerly Alternative 2 in the Preliminary Program Alternatives Memorandum, PWA and others, 2005). This alternative was eliminated in favor of the bookend approach with more explicit reliance on adaptive management. The impacts associated with a 75:25 alternative would fall between the two bookends, therefore analysis of this intermediate point would not provide additional information for NEPA/CEQA impact analysis.

The revised alternatives approach also considers the phased implementation of the two restoration alternatives. For example, using the adaptive management approach, Alternative B could represent an early phase of Alternative C. In order to achieve phased implementation, the alternatives required some refinement, particularly with respect to the flood control levee alignment. In the preliminary alternatives, the levee alignments varied in order to show alignment “options”. In the initial project assessment, several different levee alignments were considered: The flood control levees could be located on the inboard (landward) side of managed ponds or on the outboard (bayward) side.. The outboard location has the benefit of requiring only a single levee for both pond creation and flood management, while an inboard flood levee still requires a bayward levee to form the pond. However, construction of a levee on the outboard side of a managed pond precludes that pond being restored to tidal habitat a later date. In addition, levee construction and maintenance are typically more expensive and difficult. Therefore, to maintain the maximum flexibility in the habitat mix and for optimal flood management, the levee alignments were consolidated and the inboard location was chosen for both Alternatives B and C.

The consolidation in levee alignments also resulted in changes to tidal habitat and managed pond locations, most notably in the Ravenswood pond complex between ponds R3 and R4, and in the A3W/B2

pond cluster in the Alviso Pond Complex. The previous alignments in these locations called for the creation of a new levee on the pond bed. In order to make Alternative B an early phase of Alternative C, the flood control levee was moved to the inboard side, and the managed ponds area was re-defined so that new managed pond levees would not be constructed in Alternative B, only to be later removed in Alternative C. For example, in the Ravenswood pond complex, the new levee that bisected pond R4 in the preliminary alternative was moved to the existing managed-pond levee between ponds R3 and R4. Similar changes were made to the public access alignments in order to minimize the creation of new trails in Alternative B that would later be removed in Alternative C.

2. Alternative A: No Action

The No Action Alternative has been updated, both with respect to the planned ISP operations and with respect to year 50 conditions (Appendix C). The planned ISP operations have been updated based on current ISP implementation and planned implementation efforts. The year 50 conditions have been described based on the most likely No Action scenario in the absence of the long-term restoration project. Both updates were based on conversations with CDFG and USFWS, and additional revisions will likely occur based on continuing discussions.

3. Alternative B: Managed Pond Emphasis

Alternative B (formerly Alternative 1 in the Preliminary Program Alternatives Memorandum, PWA and others, 2005) was revised based on comments from the USFWS Endangered Species Program and the landowners. One change in particular related to the trails into the tidal habitats. These trails were shortened based on concerns about interactions between humans and endangered species. This reduction in trail does not affect the Bay Trail spine. There was additional concern regarding the number of trails bordering upland transition habitat; however, the trails will be separated from sensitive upland transition habitat through the use of appropriate buffers. This was considered a design issue and will be considered during the design of future phases of the project.

Additional public access changes occurred in response to two field tours in September 2005 and a public access workshop in October 2005. In general, public access options were refined and consolidated, focusing on the public access options that offer the highest quality public access, including the addition of the water trail and additional public access details specified on the alternative maps. This approach is beneficial for use with the adaptive management / phased implementation approach.

Habitat changes also occurred at Pond A8. Pond A8 was made reversibly tidal in order to test concerns related to mercury methylization and mobilization. In order to maintain a 50:50 tidal to managed-pond habitat ratio, ponds A12 and A17 were switched from tidal habitat to managed ponds. These changes also correlated well with a phased implementation approach.

As mentioned previously, the flood control levees were also revised, and the flood control levees now follow the inboard perimeter levees. This primarily affected the levee alignment in the Ravenswood pond complex between ponds R3 and R4, and the alignment in the Alviso pond complex between Stevens

Creek and the Sunnyvale Treatment Ponds. The flood control levee alignment at Eden Landing south of Old Alameda Creek was also revised based on input from Alameda County Flood Control and Water Conservation District.

4. Alternative C: Tidal Habitat Emphasis

In general, Alternative C (formerly Alternative 3 in the Preliminary Program Alternatives Memorandum, PWA and others, 2005) was refined in a similar manner as Alternative B with respect to changes in public access and recreation. The primary public access addition for this alternative is a the new loop trail at pond A3W to create a loop trail experience and offset for the loss of the A9 loop trail when ponds A9 through A15 become tidal habitat.

In Eden Landing, pond E10 was switched to managed-pond habitat at the request of DFG, and pond E14 became tidal habitat in order to maintain a 90:10 habitat ratio. No significant changes were made to the flood control levees in this alternative, other than the revision of the flood control levee alignment at Eden Landing consistent with Alternative B.

References

PWA, H. T. Harvey & Associates, EDAW, Brown and Caldwell. 2005. Preliminary Program Alternatives Memorandum. San Francisco, CA.: Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

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APPENDIX C – NO ACTION ALTERNATIVE DETAIL

The No Action Alternative is the most likely outcome in the absence of a long-term restoration plan. The No Action Alternative is based on the professional judgment of the landowners and project planners with respect to future levels of funding for land-management, the expected lifetime of existing levees and hydraulic structures, and other factors that are inherently difficult to estimate. The No Action Alternative may change somewhat in the future as specific assumptions are refined. The landowners will coordinate with the local flood management agencies to focus their maintenance funds on pond levees with high priority to be maintained.

The main text of the Final Alternatives Report provides an overview and map of the most likely No Action Alternative at Year 50 (Figures 1a – 1c). The following sections detail specific No Action scenarios for each pond complex.

1. Eden Landing

California Department of Fish and Game (CDFG) currently has an operations and maintenance budget for Eden Landing under an endowment of approximately \$10k/year plus some limited supplemental funds. Additionally, CDFG has an annualized levee maintenance budget of approximately \$80k/year. However, levee upgrades can consume multiple years' annual allocation. For example, \$500k was recently spent upgrading pond levees between Old Alameda Creek and the Alameda Creek Flood Control Channel (ACFCC). Pumping costs are not currently covered under the endowment or levee maintenance budget and would be considered an additional operations cost.

The planned ISP management of Eden Landing as of 2006 (Figure 5a in the main text of the Final Alternatives Report) has changed from the original ISP plan (John Krause and Carl Wilcox CDFG, pers. comm.). The ISP maps were updated based on current operations; however, additional management changes could further revise operations. The culvert connection to the bay at E2 has been implemented; the old E10 culvert connection recently failed and will be replaced in 2006. Levees with the highest risk of failure or overtopping are: levees around ponds E8A, E9, E12, E13, and E14; the bayward levees along E1 and E2; and levees along the south side of ponds E2, E4, and E5.

Under the most likely No Action scenario, none of the pumps would be operated due to lack of funding for electricity, with the exception of the pump at Pond E1; however, the pumps will be maintained as funding allows. Without the pumps, the 'C' sub-system (Ponds E1C, E4C, and E5C) would be the first ponds to become seasonal wetlands because no summer inflow exists in the absence of pumping. Pond E2C could operate as muted tidal using the existing ISP control structure.

In the short- to medium-term, Ponds E1, E2, E4 and E7 could operate as managed ponds, and E5, E6, and E6C could operate as high salinity ponds in the winter and seasonal ponds in the summer. However, all internal structures will likely fail within 5 to 20 years and the ponds would become seasonal. Successive dry years would cause all the ponds with the exception of Ponds E1 and E2 to become seasonal earlier

due to the limited ability to circulate adequate amounts of bay water through the system to meet salinity discharge requirements. If the levees outboard of Ponds E1 and E2 fail, all ponds between Old Alameda Creek and the ACFCC would eventually become tidal with the exception of the ponds E1C, E2C, E4C, and E5C. These ponds would be maintained as seasonal wetlands in order to provide some level of flood protection.

Ponds E10, E11, E8, E6A, and E6B are expected to remain as managed ponds for the 50-year planning horizon. The pond levees for Ponds E8A, E9, E12, E13, and E14 will not be maintained. These ponds will initially operate as seasonal wetlands, and will eventually become tidal as the levees erode and breach. CDFG is expected to focus their limited levee maintenance and improvement funds on the levees along the east side of Ponds E4, E5, E6, and E6C to reduce the potential for periodic overtopping into areas that currently provide flood detention for low-lying areas of Alameda County.

2. Alviso

The USFWS currently has an operational budget of \$200k/year for management and maintenance of the Alviso pond complex; however, this sum is likely insufficient to cover even ongoing levee maintenance. Figure 5b presents the planned ISP operations as of 2006, with the exception of ponds A22 and A23. Cargill continues to manage ponds A22 and A23 in order to reduce salinities. Once salinities are reduced, these ponds are expected to be turned over to USFWS.

In general, the Alviso complex is in better condition than the other two complexes. Most of the internal hydraulic structures have been recently upgraded or replaced, with the exception of the siphons which are old, hidden, and unreliable. The A9 levee system (A9, A10, A11, A12, A13, A14, and A15) has been recently maintained per typical salt pond maintenance (placement of excavated bay sediment on the levees). While these are not designed as flood protection structures, the maintained salt pond levees have provided historical flood protection benefits. However, the levee system from A1 through A8 has not been maintained within the past 6 years and is in poorer condition. The outboard levees along A1 through A6 are subject to high erosive forces.

Under the most likely No Action scenario (Figure 1b), ponds A9, A10, A11, A14, A16 and A17 would remain as managed ponds, and ponds A12, A13, and A15 would become seasonal wetlands if funding is not available to operate the pumps. Levees along ponds A5, A6, and A7 are the least likely to be maintained. The levees would be allowed to erode, creating additional tidal habitat in A5, A6, and A7 through uncontrolled breaching. The levee along the east side of Pond A8 would be raised to prevent frequent tidal overtopping into A8/8S. Pond A8/A8S would operate as a seasonal wetland with direct rainfall and evaporation only. Existing flood detention storage would be maintained in Pond A8, but not in Ponds A5, A6, and A7. This loss of flood detention storage has the potential to raise water surface elevations at the mouth of Guadalupe Creek/Alviso Slough and reduce flood protection. It would require hydraulic assessment to determine the most effective method for compensating for the loss of flood storage, and restoring flood hazard management to the current level.

Levees around the ponds east of Guadalupe Slough (A1 through A3W) are high priority levees to be maintained. Levees for the ponds between Stevens Creek and Guadalupe Slough currently provide some level of flood protection for Moffett Field. For the 50-year scenario, it is assumed these outboard levees are maintained (or repaired upon failure) and the associated ponds are not actively managed. Ponds A19, A20, and A21 will be restored to tidal habitat under the ISP. Ponds A22 and A23 would become seasonal wetlands.

3. Ravenswood

Cargill is currently maintaining the Ravenswood pond complex until salinities are reduced, and then the ponds will be turned over to the USFWS for ongoing management. Figure 5c depicts the planned ISP operations, although it is unlikely that any of the ISP structures will be installed due to lack of funding, with the exception of the bay connection in pond SF2. Therefore, under the most likely No Action scenario (Figure 1c), the remaining ponds (R1, R2, R3, R4, R5 and S5) would function as seasonal wetlands unless levees failed. The outboard levees along pond R1 and R2 are in poor condition. It is assumed that these levees would be maintained or repaired upon failure to provide flood protection for the PG&E substation. SF2 could continue operating as a managed pond for the 50-year planning horizon.

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APPENDIX D – PUBLIC ACCESS AND RECREATION DETAIL

Table D1. Eden Landing Pond Complex Public Access and Recreation

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
Trails	Seasonal Levee Trail	Along perimeter of Ponds E12 and E13	X	X
	Year-Round Levee Trail	Eastern edge of Pond E12- provides year-round access to Oliver Salt Works Historical Site	X	X
	Year-Round Levee Loop Trail	Northern and western edges on Pond E6C south through E1C to connect with existing trail along northern edge of Alameda Creek Flood Control Channel to levee trail along east side of E3C. This forms a loop trail that could be accessed from the Alameda Creek Stables staging area.		X
	Seasonal Levee Trail	Southern edges of Ponds E11 and E10	X	X
	Year-Round Levee Trail	Southern edges of Ponds E4C and E5C	X	
	Year-Round Levee Trail	North side of Old Alameda Creek, along the southern edge of Ponds E8 and E6A	X	
	Year-Round Levee Trail	South side of Old Alameda Creek, along the northern edge of Pond E6		X
	Year-Round Levee Trail (Bay Trail Spine)	On flood control levees along northern and eastern edges of pond complex	X	X
Access Points and Staging Areas	Staging Area	Provided at entry to Eden Landing Road near Mt. Eden Creek bridge and northern edge of Pond E12	X	X
	Staging Area	Existing staging area at Alameda Creek Stables to provide access to E3C and E1C* trails.	X	X
	Bridge Crossing	Bridge Crossing at Alameda Creek Flood Control Channel *	X	X
Boating (non-motorized)	In Bay and sloughs, launching site at southeastern corner of Pond E11	Accessible slough and marsh channels (>4 meter wide)	X	X

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
Historic Features	Oliver Salt Works	West end of Pond E12 north of Pond E13	X	X
	Alvarado Salt Works	West end of Pond E6	X	X
Hunting	Controlled access on specific hunt dates (from blinds and levees as specified by CDFG)	Marsh areas and all ponds with sufficient water except Pond E6A and the 835-acre restoration site (recreation access may be limited during hunting dates)	X	X
Fishing	Controlled access by season and area	From boat or from shore, as designated by DFG	X	X
Interpretive/Education Stations		Provided at Oliver Salt Works, Alvarado Salt Works and at key locations along trails	X	X
Viewing Platforms	Raised accessible structures or placed at a key highpoint for best vantage of surrounding landscape; interpretive signage and information integrated into design.	Terminus of Seasonal Trail south of Ponds E11 and E10	X	X
		Terminus of year-round trail in southern part of Pond E8	X	
		Terminus of year-round trail in northern part of Pond E7 at northwestern corner of Pond E6A		X
		Terminus of trail north of Pond E2C	X	
		Western edge of E6C along levee trail		X

* Bridge crossing in cooperation with Alameda County Flood Control and Water Conservation District.

Table D2. Alviso Pond Complex Public Access and Recreation

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
Trails	Seasonal Levee Trail	Eastern edge of Pond A2W – coincides with PG&E access	X	X
	Year-Round Levee Trail (Bay Trail spine)	Southern edge of Ponds A2E, A3W linking existing segments of the Bay Trail Spine	X	X
	Year-Round Trail Adjacent to Existing Rail Corridor (Bay Trail spine)	Northwestern corner of A23 south to northeastern corner of Pond A17 to pass over Drawbridge		X
	Proposed Year-Round Levee Trail (outside of project area (Bay Trail spine)	Extends south from year-round flood-control levee trail (south of Pond A2E) along western edge of Stevens Creek Open Space Preserve	X	X
	Year-Round Levee Trail	Northern edge of Pond A3W to creating a loop trail from Bay Trail spine in C only	X	X
	Year-Round Levee Trail	Extends north from Pond A17 across Coyote Creek to connect to Bay Trail Spine at northwestern corner of Pond A23, provides viewing access to historic Town of Drawbridge		X
	Year-Round Levee Trail (Bay Trail spine)	Northern edge of Pond A22 to connect existing Bay Trail Spine to points south	X	X
	Vehicular Access	Southerly side of the Sunnyvale Treatment Ponds and along the southeast edge of Pond A3W*	X	X
	Proposed Trail (outside project area)	City of San Jose Bay Trail spine segment surrounding the “Legacy” property, located at the southeast corner of Pond A8S. The City of San Jose has proposed a pedestrian bridge crossing Alviso Slough to access this proposed Bay Trail segment	X	X
	Proposed Trail (outside project area) Bay Trail spine	Connects Guadalupe River Trail with Coyote Creek Trail (alternate Bay Trail spine segment)	X	X
Proposed Trail (outside project area)	Extends from northeastern edge of Pond A22 connecting to existing segments of Bay Trail Spine	X	X	
Access Points and Staging Areas		Don Edwards EEC	X	X
		Kayak launch, fishing and trail access provided on southwest corner of Pond A12, at Alviso Marina County Park (immediately adjacent to pond complex)	X	X

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
		Access to Pond A8 (hunting and service only)	X	X
		Kayak, hunting, and fishing access provided on eastern side of Pond A3W	X	X
Boating (non-motorized recommended)	Bay, Alviso Slough Channel, Guadalupe Slough Channel	Accessible slough and marsh channels (>4 meter wide) (Check for seasonal closures)	X	X
Historic Features	Drawbridge remnants	Between ponds A20 and A21	X	X
	Historic Cannery Building	In Alviso, outside of the SBSP Project Area but owned by USFWS	X	X
Hunting	Controlled access on specific hunt dates and areas (from blinds and levees as specified by USFWS)	Currently to match the ISP Hunt Plan Amendment, Ponds A2E, AB1, AB2, A3W, A3N, A5, A7 and the northern portion of A8 within the Alviso complex would be open to hunting on Saturdays, Sundays, and Wednesdays; a Refuge Special Use Permit would be required. Pond A19 is open to hunting under the current Hunt Plan.	X	X
Fishing	By boat in Bay and sloughs only	Mallard Slough closed to boating March 1 – August 31	X	X
Interpretive/Education Stations and Programs	Don Edwards Environmental Education Center	Located south of Pond A16, outside of project area	X	X
	Docent-led tours Interpretive displays** Environmental education field trips, hands-on activities, classroom presentations and other outreach	Along hiking trails, at wildlife observation areas, and throughout the Refuge	X	X
Viewing Platforms		At terminus of seasonal trail along Pond A2W	X	X
		At terminus of Year-round trail at northeastern edge of Pond A3N		X
		At terminus of year-round trail at northeastern edge of Pond AB2	X	

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
		Northeastern corner of Pond A8S (to be coordinated with City of San Jose)	X	X
		Eastern edge of Pond A16	X	X
		Viewing platform between Ponds A12 and A13		X
<p>Access agreement must be obtained from the City of Sunnyvale and Cargill. *Trail segment at A3W to Guadalupe Slough in cooperation with Cargill. ** Interpretive display at Shoreline Park in cooperation with the City of Mountain View.</p>				

Table D3. Ravenswood Pond Complex Public Access and Recreation

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
Trails	Year-Round Trail	Extends from existing Bay Trail Spine north between Ponds R5/S5 and R4/R3	X	X
	Year-Round Trail	Northwestern edge of Pond R4	X	X
	Year-Round Trail	Eastern and southern edges of Pond SF2	X	
		West and southwestern edge of Pond SF2		X
	Year-Round Loop Trail	Northern and eastern edges of Pond R3 creating a loop trail from existing Bay Trail spine along Hwy. 84	X	
	Proposed Trail (outside project area)	Extends West from existing Bay Trail Spine, south of Pond 7C	X	X
	Proposed Trail (outside project area)	Connects existing Bay Trail Spine north of Ravenswood Open Space Preserve to Year-Round Trail in Pond SF2	X	X
Proposed Trail (outside project area) (Bay Trail spine)	Connects Existing Bay Trail spine segments west of Faber-Laumeister Marsh	X	X	
Access Points and Staging Areas	Kayak Launch	Eastern region of complex, at base of Ravenswood Slough		X
Boating (non-motorized recommended)	Bay and its tributaries	Accessible slough and marsh channels (>4 meter wide) (Check for seasonal closures)	X	X
Historic Features	Historic red barn	South of Bayfront Park by Pond S5	X	X
Hunting	Controlled access on specific hunt dates and areas (from blinds and levees as specified by USFWS)	Ponds R1 and R2 (except the southeastern portion of R2 next to the highway); from boats, shore, or levees.	X	X
Fishing		Not allowed from ponds; Available from the Bay	X	X

Recreational Features	Description	Locations	Included in Alternative B	Included in Alternative C
Interpretive/Education Stations and Programs	Docent-led tours Environmental education field trips, hands-on activities, classroom presentations and other outreach	Various locations	X	X
Viewing Platforms		Along proposed year round trail, east of Pond R5	X	X
		Northeast corner of Bayfront Park	X	X
		At terminus of proposed year-round trail northwest of Pond R4	X	X
		Eastern region of Complex, at southern terminus of existing spur at Pond SF2 at water's edge	X	X
		At junction of proposed year-round trail and Bay Trail Spine, northeast of Pond SF2	X	
		At junction of proposed year-round trail and proposed trail south of Pond SF2		X
		At northeastern corner of Pond R3 accessed by proposed year-round trail at Pond R3	X	
		Base of Ravenswood Slough, at northern terminus of proposed year-round trail		X

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APPENDIX E – EVALUATION CRITERIA AND METRICS TABLE

Table E1. Evaluation Criteria and Metrics

BIOLOGICAL HABITAT		
Objective 1. Create, restore, or enhance habitats of sufficient size, function, and appropriate structure to:		
Objective 1A. 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.		
Evaluation Criteria	Metrics	Analysis Method
1. Contribute to the recovery of the south bay subspecies of the salt marsh harvest mouse	<ul style="list-style-type: none"> • Area of complete salt marshes, with broad marshplain (i.e., pickleweed) habitat and broad upland/peripheral halophyte transitional zones • Connectivity of such existing and restored marshes both within and adjacent to the project area • Proximity of restored marshes to existing marshes providing suitable salt marsh harvest mouse habitat 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (estimates of salt marsh establishment) • Hydrodynamic Modeling (water levels inform vegetation colonization predictions, salinity modeling informs vegetation types) • Alternative Design (salt marsh habitat locations and upland transition zone placement)
2. Contribute to the recovery of the California Clapper Rail	<ul style="list-style-type: none"> • Area of broad tidal marshes with suitable channel densities and appropriate vegetation structure 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (estimates of salt marsh establishment, empirical analyses of channel formation based on previous restoration efforts and historical information) • South Bay Bird Use Assessment • Hydrodynamic Modeling (water levels inform vegetation colonization predictions, salinity modeling informs vegetation types)
3. Re-establish populations of special-status plants	<ul style="list-style-type: none"> • Area of high marsh/upland transitional zones • Connectivity of existing and restored high marsh/upland transitional zones, both within and adjacent to the project area • Proximity of restored high marsh/upland transitional zones to existing populations of special-status species 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (estimates of salt marsh establishment) • Alternative Design (salt marsh habitat locations and upland transition zone placement)
4. Contribute to the recovery of the Western Snowy Plover	<ul style="list-style-type: none"> • Area of suitable breeding habitat (salt pan, islands, undisturbed levees) in combination with appropriate foraging habitat. 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment • South Bay Bird Use Assessment • Alternatives Design (managed ponds with islands and undisturbed levees)
5. Enhance habitat for anadromous special-status fish (Salmon and steelhead)	<ul style="list-style-type: none"> • Length of tidal channel habitat within marshes connected to creek and river systems that support or could support these species 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (empirical analyses of channel formation based on previous restoration efforts and historical information)

Table E1. Evaluation Criteria and Metrics (cont.)

BIOLOGICAL HABITAT		
Objective 1B. Maintain current migratory bird species that utilize existing salt ponds and associated structures such as levees.		
Evaluation Criteria	Metrics	Analysis Method
1. Maintain or increase current populations of some or all bird species breeding at the salt ponds	<ul style="list-style-type: none"> • Area of managed ponds with associated breeding islands, undisturbed levees, and associated breeding structures 	<ul style="list-style-type: none"> • South Bay Bird Use Assessment (bird-use modeling and empirical analyses) • Alternatives Design (managed ponds with islands, undisturbed levees, and breeding structures)
2. Maintain habitat for salt pond specialized birds (e.g., Wilson’s Phalaropes)	<ul style="list-style-type: none"> • Area of managed pond habitat with somewhat elevated salinities (100-140 ppt), and appropriate depths 	<ul style="list-style-type: none"> • South Bay Bird Use Assessment (bird-use modeling and empirical analyses) • Alternatives Design (high salinity managed pond)
3. Maintain current population levels for foraging shorebirds	<ul style="list-style-type: none"> • Estimate of foraging habitat area, including mudflat exterior to salt ponds, ponds and pans in tidal marshes and suitable foraging areas in managed ponds 	<ul style="list-style-type: none"> • South Bay Bird Use Assessment (bird-use modeling and empirical analyses) • South Bay Geomorphic Assessment (historical information and empirical analyses regarding pond and pan formation) • Hydrodynamic Modeling (mudflats exterior to ponds) • Alternatives Design (managed pond water level management)

Table E1. Evaluation Criteria and Metrics (cont.)

BIOLOGICAL HABITAT		
Objective 1C. 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.		
Evaluation Criteria	Metrics	Analysis Method
1, 3. Maintain or enhance the populations of intertidal invertebrates and larger shorebirds that forage almost exclusively on intertidal mudflats	<ul style="list-style-type: none"> Area of mudflat habitat available in the South Bay through the life of the project 	<ul style="list-style-type: none"> South Bay Bird Use Assessment (bird-use modeling and empirical analyses) South Bay Geomorphic Assessment (estimates of intertidal habitat) Hydrodynamic Modeling (mudflats exterior to ponds)
2. Enhance South Bay fish populations	<ul style="list-style-type: none"> Area of tidal marsh and tidal channel habitat within marshes, in combination with bay and mudflat habitat 	<ul style="list-style-type: none"> South Bay Geomorphic Assessment (estimates of salt marsh establishment, empirical analyses of channel formation based on previous restoration efforts and historical information) Hydrodynamic Modeling (Bay and mudflat habitat exterior to ponds)
4a. Maintain or enhance the populations of diving ducks currently using the Bay	<ul style="list-style-type: none"> Area of deeper-water managed ponds, bay mudflats, and shallow subtidal areas 	<ul style="list-style-type: none"> South Bay Bird Use Assessment (bird-use modeling and empirical analyses) South Bay Geomorphic Assessment (estimates of intertidal and subtidal habitat) Alternatives Design (managed pond water level management) Hydrodynamic Modeling (Bay and mudflat habitat exterior to ponds)
4b. Maintain or enhance the populations of dabbling ducks currently using the Bay	<ul style="list-style-type: none"> Length of edge habitat between vegetated marsh and open water or mudflat, including bay/mudflat edge, channels, and marsh ponds 	<ul style="list-style-type: none"> South Bay Geomorphic Assessment (estimates of salt marsh establishment, empirical analyses of channel, pond, and pan formation based on previous restoration efforts and historical information) Hydrodynamic Modeling (Bay and mudflat habitat exterior to ponds)
5. Enhance harbor seal habitat for foraging and isolated haul-out areas	<ul style="list-style-type: none"> Area of new isolated, large/deep tidal channels adjacent to marsh plain 	<ul style="list-style-type: none"> South Bay Geomorphic Assessment (empirical analyses of large channel formation based on previous restoration efforts and historical information)

Table E1. Evaluation Criteria and Metrics (cont.)

FLOOD MANAGEMENT		
Objective 2. Maintain or improve existing levels of flood protection in the South Bay area.		
Evaluation Criteria	Metrics	Analysis Method
1. Maintain* or improve levels of coastal flood protection in the project area ¹	<ul style="list-style-type: none"> • Area removed from the coastal floodplain 	<ul style="list-style-type: none"> • Coastal Flood Analyses • Hydrodynamic Modeling (water levels)
2. Maintain* or improve levels of fluvial flood protection in the project area ^{1,2}	<ul style="list-style-type: none"> • Volume of channel enlargement • Length of levee lowered and/or removed 	<ul style="list-style-type: none"> • Fluvial Flood Modeling • Hydraulic Geometry Analyses • Hydrodynamic Modeling (water levels relevant to local drainage)

¹ in areas where flooding is not desirable based on land use

² include consideration of sediment deposition and erosion effects on water levels and flood protection facilities (such as levees)

* EXCLUSION CRITERION, i.e. must be met by alternative during all project phases to carry forward and receive further consideration

Table E1. Evaluation Criteria and Metrics (cont.)

PUBLIC ACCESS & RECREATION		
Objective 3. Provide public access and recreational opportunities compatible with wildlife and habitat goals.		
Evaluation Criteria	Metrics	Analysis Method
1. Improve public access and recreation in the project area	<ul style="list-style-type: none"> • Miles of levee trails located within project area • Miles of tidal trails located within project area • Miles of marsh and slough channels • Number of compatible public access and recreation opportunities consistent with DFG and USFWS missions and other relevant agency plans, policies and regulatory requirements. • Number of opportunities for multi-agency/stakeholder partnering to plan, implement and manage public access and recreation 	<ul style="list-style-type: none"> • Alternatives Design
2. Provide for a variety of uses and user types	<ul style="list-style-type: none"> • Number of user groups and individuals that can be accommodated. • Number of multi-use access points (trails that meet edge of water) and staging areas with amenities required for a variety of different uses. • Range and diversity of uses provided 	<ul style="list-style-type: none"> • Alternatives Design
3. Enhance opportunity for aesthetic experiences	<ul style="list-style-type: none"> • Number and quality of user experiences provided (e.g. miles of seaward levee trails, bridge and ROW connections and access to historic features). • Number of opportunities for multi-sensory experiences. (e.g. open water and marsh views, smells of the bay, audibility of wildlife and others) • Number of viewing areas/viewpoints/ scenic overlooks • Number of access points and trails that are close to the open bay 	<ul style="list-style-type: none"> • Alternatives Design
4. Provide regional linkages	<ul style="list-style-type: none"> • Number of links provided • Number of Bay Trail spine gaps closed and spur and connector trails provided • Gaps closed in the Bay Trail spine and alignments adjacent to restoration area. • Number of links to public transit • Number of opportunities for non-motorized, multi-modal access to and from the project area 	<ul style="list-style-type: none"> • Alternatives Design

Table E1. Evaluation Criteria and Metrics (cont.)

WATER & SEDIMENT QUALITY		
Objective 4. Protect or improve existing levels of water and sediment quality in the South Bay, and take into account ecological risks caused by restoration.		
Evaluation Criteria	Metrics	Analysis Method
1. Improve levels of water quality for total dissolved solids, metals, dissolved oxygen (surface and ground water)	<ul style="list-style-type: none"> • Acres of tidal wetlands • Residence time 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (estimates of salt marsh establishment) • Hydrodynamic Modeling (residence time and salinity modeling comparing no action and alternatives for some constituents) • Nutrient and Contaminant Analyses • Groundwater Analysis
2. Limit ecological risk associated with mercury methylation and bioaccumulation and mobilization of mercury present in sediments	<ul style="list-style-type: none"> • Acres of tidal wetlands • Water levels and inundation frequencies in restored areas and managed ponds • Volume of channel enlargement and scour 	<ul style="list-style-type: none"> • South Bay Geomorphic Assessment (estimates of salt marsh establishment) • Hydrodynamic Modeling (water levels, salinity) • Nutrient and Contaminant Analyses • Hydrodynamic Modeling (potential for particle tracking modeling for high concentrations areas, for project-level (e.g., Phase 1) modeling) • Hydraulic Geometry Analyses • Fluvial Flood Modeling

Table E1. Evaluation Criteria and Metrics (cont.)

NUISANCE SPECIES MANAGEMENT		
Objective 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.		
Evaluation Criteria	Metrics	Analysis Method
1. Minimize colonization of mudflats and marshplain by non-native <i>Spartina</i> and its hybrids	<ul style="list-style-type: none"> Area of mudflat and marshplain potentially colonizable by non-native <i>Spartina</i> and its hybrids (assuming that no control measures are found to be feasible) 	<ul style="list-style-type: none"> South Bay Geomorphic Assessment (estimates of colonizable mudflats and marshplain) Hydrodynamic Modeling (water levels, salinity) Invasive <i>Spartina</i> Technical Memorandum
2. Maintain or improve the current levels of vector management	<ul style="list-style-type: none"> Area of potential mosquito habitat 	<ul style="list-style-type: none"> Alternatives Design
3. Improve protection from non-native and nuisance predators and reduce need for predator management	<ul style="list-style-type: none"> Area of tidal marshes and levees easily accessible by non-native mammalian predators (e.g., cats, dogs, and red foxes) 	<ul style="list-style-type: none"> South Bay Geomorphic Assessment (estimates of salt marsh establishment) Alternatives Design
4. Minimize colonization by non-native <i>Lepidium</i>	<ul style="list-style-type: none"> Area of potentially colonizable brackish marsh and transitional areas 	<ul style="list-style-type: none"> Hydrodynamic Modeling (salinity modeling) Alternatives Design (upland transition zone locations)

* EXCLUSION CRITERION, i.e. must be met by alternative to carry forward and receive further consideration

INFRASTRUCTURE		
Objective 6. Protect the services provided by existing infrastructure (e.g. power lines, railroads, wastewater treatment plants).		
Evaluation Criteria	Metrics	Analysis Method
1. Maintain the services provided by existing infrastructure	<ul style="list-style-type: none"> Must not increase risk of failure or service degradation due to physical changes* 	<ul style="list-style-type: none"> Hydrodynamic modeling (comparing hydrodynamic changes which affect PG&E towers, outfalls, etc.)
2. Maintain maintenance access for existing infrastructure	<ul style="list-style-type: none"> Does not eliminate maintenance access due to physical changes or limitations resulting from habitat improvements. 	<ul style="list-style-type: none"> Alternatives Design

• EXCLUSION CRITERION, i.e. must be met by alternative to carry forward and receive further consideration

Table E1. Evaluation Criteria and Metrics (cont.)

COST EFFECTIVENESS ¹		
Objective 7. Consider costs of implementation, management, and monitoring so that planned activities can be effectively executed with available funding. Form partnerships and alliances to develop and institute a long-term viable funding strategy.		
Evaluation Criteria	Metrics	Analysis Method
1. Restoration construction costs	• Dollars	• Cost estimates
2. Long-term restoration operations and maintenance costs	• Dollars, 50-year time frame	• Cost estimates

¹ Not used until suitable information becomes available

ENVIRONMENTAL IMPACT		
Objective 8. Promote environmental benefit and reduce impact in topics other than biology.		
Evaluation Criteria	Metrics	Analysis Method
1. Preserve cultural resources, including important archaeological and historical sites	<ul style="list-style-type: none"> • Number of cultural resource sites impacted • Number of opportunities for interpretation and education 	• NEPA/CEQA Impact assessment
2. Provide public services to accommodate projected demand	<ul style="list-style-type: none"> • Number of law enforcement patrols needed • Response times for fire, police and ambulance services 	• NEPA/CEQA Impact assessment
3. Promote compatibility with surrounding land plans and uses	• Level of land use compatibility	• NEPA/CEQA Impact assessment
4. Provide safe, convenient access to the project area while managing congestion on nearby streets	<ul style="list-style-type: none"> • Number of vehicle trips • Number of parking spaces • Number of bicycle lanes • Level of service on nearby roads 	• NEPA/CEQA Impact assessment
5. Enhance air quality for proposed and surrounding uses	<ul style="list-style-type: none"> • Air pollutant levels • Potential for creation of objectionable odors 	• NEPA/CEQA Impact assessment
6. Manage noise levels for proposed and surrounding uses	<ul style="list-style-type: none"> • Decibel levels • Number of noise-generating activities • Distance between noise-generating activities and nearby sensitive receptors 	• NEPA/CEQA Impact assessment

APPENDIX F – TECHNICAL RATINGS AND RATIONALE

Insert tables of revised evaluation criteria w/ technical ratings and rationale – these are in the excel spreadsheet Appendix_E_Tech_Ratings.xls – just PDF this file and insert into the final PDF.

Appendix F – Technical Ratings and Rationale

BIOLOGICAL HABITAT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
1A-1	Contribute to the recovery of the South Bay subspecies of the salt marsh harvest mouse*	3	5	8	<p>No Action: Increase in tidal salt marsh due to sedimentation of South Bay, restoration of Island Ponds, and some uncontrolled breaching as levees erode.</p> <p>Alts B-C: Ranked according to extent of large, connected salt marsh with upland escape cover. Alt B, not ranked as high as for Clapper Rail due to poor connectivity between restored marshes and less upland transitional habitat (which affects the mouse more than the rail) in Alt B.</p>
1A-2	Contribute to the recovery of the California Clapper Rail*	3	5	8	<p>No Action: Increase in tidal salt marsh due to sedimentation of South Bay, restoration of Island Ponds, and some uncontrolled breaching as levees erode.</p> <p>Alts B-C: Ranked according to extent of large, contiguous salt marsh with dendritic channels.</p>
1A-3	Re-establish populations of special status plants*	1	4	8	<p>No Action: Limited existing habitat, with no expected habitat enhancement.</p> <p>Alts B-C: Ranked according to extent of upland ecotone, and possibly beach habitat.</p> <p>Assumptions: Active revegetation of special-status plant species and import of fill material to provide an upland transitional zone will occur.</p>

Appendix F – Technical Ratings and Rationale

BIOLOGICAL HABITAT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
1A-4	Contribute to the recovery of the Western Snowy Plover**	4	7	5	<p>No Action: Uncontrolled breaching and establishment of vegetation in seasonal wetlands expected to reduce habitat (though degree of reduction uncertain).</p> <p>Alt B: Enhanced breeding habitat (e.g., islands, furrowed ponds) in reconfigured/enhanced ponds augments salt pan/seasonal wetland habitat.</p> <p>Alt C: Reconfigured ponds managed to support high nesting densities (e.g., islands, furrowed ponds), but lacks extent of seasonal pond habitat of Alt. B.</p> <p>Assumptions/Uncertainties: Much more active avian predator management will occur under Alts B-C than for No Action. Assumes that creation of numerous islands in reconfigured ponds, and possibly the use of furrowed ponds, in Alts B and C will support high densities of nesting plovers; an uncertain assumption that will be tested through adaptive management experiments.</p>
1A-5	Enhance habitat for anadromous special-status fish (salmon and steelhead)*	2	5	9	<p>No Action: Increase in tidal salt marsh from sedimentation of South Bay, restoration of Island Ponds, and some uncontrolled breaching as levees erode.</p> <p>Alts B-C: Ranked according to extent of tidal restoration along major sloughs with existing or potential spawning. Alt C ranks "9" (rather than "8") because the incremental increase in benefits to anadromous fish that would be gained by restoring the final 10% of managed ponds in Alt C would be fairly low since these ponds are not located along major sloughs. Thus, the 90:10 alternative comes very close to maximizing benefits of restoration to anadromous fish.</p>

Appendix F – Technical Ratings and Rationale

BIOLOGICAL HABITAT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
1B-1	Maintain or increase current populations of some or all bird species breeding at the salt ponds**	3	7	5	<p>No Action: Erosion of nesting islands, uncontrolled breaches, and invasion of seasonal wetlands by vegetation will reduce nesting habitat.</p> <p>Alt B: Enhanced breeding habitat (e.g., islands, furrowed ponds) in reconfigured/enhanced ponds augments salt pan/seasonal wetland habitat in ponds.</p> <p>Alt C: Reconfigured ponds managed to support high nesting densities (e.g., islands, furrowed ponds), but lacks extent of seasonal/managed pond habitat of Alt. B.</p> <p>Assumptions: Because Snowy Plover and California Gull are addressed elsewhere, this criterion focuses on terns, stilts, and avocets. Assumes much more active avian predator management under Alts B-C than for No Action.</p>
1B-2	Maintain habitat for salt pond specialized birds (e.g., Wilson's Phalaropes)**	4	4	2	<p>No Action: Reduction in habitat due to breaching and vegetation establishment in unmanaged seasonal wetlands.</p> <p>Alts B-C: Ranked according to extent of high-salinity managed ponds, with concurrent slight increase in salt pan habitat in restored marshes.</p> <p>Uncertainties: Although a decline in species such as phalaropes and Bonaparte's gulls is predicted as high-salinity pond habitat declines, the extent of these species' use of less saline managed ponds is unknown, and will be determined by monitoring.</p>

Appendix F – Technical Ratings and Rationale

BIOLOGICAL HABITAT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
1B-3	Maintain current population levels for foraging shorebirds**	4	4	3	<p>No Action: Decrease in suitable foraging habitat (mudflats, pans and ponds within marshes and managed pond areas) due to reduction in bay mudflats and increased vegetation in seasonal wetlands.</p> <p>Alts B-C: Because the long-term extent of intertidal mudflat will differ little between alternatives, ranked according to extent of shallow-water foraging habitat in managed ponds and marsh ponds.</p> <p>Assumptions/Uncertainties: Assumes that high-tide roosting habitat is not limiting. Uncertainties are: (1) the extent to which various shorebird species require ponds for foraging; (2) the degree to which marsh restoration will increase productivity of, and shorebird foraging conditions on, mudflats, reducing the need for foraging in ponds; (3) the magnitude of the increase in shorebird densities that can be achieved through pond management; and (4) the extent of shallow-water habitat that can be maintained at any given time within managed ponds.</p>
1C-1, 1C-3	Maintain or enhance populations of intertidal invertebrates and larger shorebirds that forage almost exclusively on intertidal mudflats**	4	5	5	<p>No Action: Slight decrease in intertidal mudflats; uncontrolled breaching likely to provide little in the way of new mudflat along larger sloughs, as breaches will not necessarily occur at optimal locations.</p> <p>Alts B-C: Slight decrease in intertidal mudflats offset somewhat by new mudflats within restored tidal marshes and along larger restored channels.</p> <p>Assumptions/Issues: Assumes that high-tide roosting habitat is not limiting. Marsh restoration is expected to increase productivity of, and thus possibly shorebird foraging conditions on, mudflats, but the degree to which shorebirds will benefit is unknown.</p>

Appendix F – Technical Ratings and Rationale

BIOLOGICAL HABITAT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
1C-2	Enhance South Bay fish populations**	4	6	8	<p>No Action: Slight decrease in intertidal mudflats; uncontrolled breaching likely to provide little in the way of complex channel networks, as breaches will not necessarily occur at optimal locations.</p> <p>Alts B-C: Increasing extent of tidal channel nursery/foraging habitat and increasing productivity of intertidal mudflats.</p>
1C-4A	Maintain or enhance the populations of diving ducks currently using the Bay**	4	4	3	<p>No Action: Increase in subtidal habitat in bay more than offset by uncontrolled breaching and conversion of some managed ponds to seasonal wetlands.</p> <p>Alts B-C: Ranked according to extent of open water 1-6 m deep. Reduction in foraging habitat in ponds due to restoration offset somewhat by increase in subtidal habitat in bay and at mouths of larger restored channels</p> <p>Uncertainties/assumptions: The increase in subtidal habitat under No Action is uncertain. The degree to which a reduction in habitat in ponds will be offset by increases in habitat in the bay and in restored sloughs is unknown, and the ratings for Alts B and C may be too low.</p>
1C-4B	Maintain or enhance the populations of dabbling ducks currently using the Bay**	6	7	8	<p>No Action: Slight increase in tidal salt marsh due to sedimentation of South Bay, restoration of Island Ponds, and uncontrolled breaching, and increase in vegetated seasonal wetlands.</p> <p>Alts B-C: Ranked according to extent of suitable foraging habitat (edge habitat between vegetated marsh and mudflat/open water). May be rated somewhat higher for most species.</p>
1C-5	Enhance harbor seal habitat for foraging and isolated haul-out areas**	5	6	8	<p>No Action: Slight increase in tidal salt marsh due to sedimentation of South Bay, restoration of Island Ponds, and uncontrolled breaching offset by loss of intertidal mudflats.</p> <p>Alts B-C: Ranked according to number, extent, and dispersion of large tidal sloughs in restored marshes for foraging and haul-out locations.</p>

Appendix F – Technical Ratings and Rationale

FLOOD MANAGEMENT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
2-1	Maintain or improve levels of coastal flood protection in the project area	2	9	9	<p><u>No Action:</u> Coastal flooding worsens as levees deteriorate and sea level rises.</p> <p><u>Alternatives B-C:</u> New levees provide coastal flood protection.</p> <p><u>Assumptions:</u> For No Action, levee breaches will be repaired for those levees that provide flood protection, but levees will fail with increasing frequency.</p>
2-2	Maintain or improve levels of fluvial flood protection in the project area	3	7	9	<p><u>No Action:</u> Fluvial flooding worsens as channel siltation continues and sea level rises.</p> <p><u>Alternative B:</u> Benefits from channel scour at the mouths of creeks and from levee lowering</p> <p><u>Alternative C:</u> Similar to Alternative B, but with greater benefits from increased channel scour and levee lowering.</p> <p><u>Assumptions:</u> For No Action, assume only Pond A8 provides measureable offline flood storage. Assume that channel siltation continues in response to past modifications (diking, dredging, and groundwater pumping). For Alternatives B and C, assume channel scour in response to increased tidal prism. The exact amount of channel scour may vary, though in all cases flood performance be at least as good or better than existing conditions. Assume selected levee lowering for flood benefits.</p>

Appendix F – Technical Ratings and Rationale

PUBLIC ACCESS AND RECREATION					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
3-1a	Improve land-based public access and recreation	3	9	8	<p>No Action: Some possible levee failures could deteriorate existing trails at Ravenswood and Alviso, decreasing land-based access.</p> <p>Alts B-C: Ranked according to miles of existing trails utilizing managed pond levees that would remain in Alt B and a reduced amount with tidal restoration. Both alternatives would complete the Bay Trail spine.</p>
3-1b	Improve water-based public access and recreation	4	7	9	<p>No Action: Some additional sitation may occur, further reducing access to sloughs for boating.</p> <p>Alts B-C: Ranked according to additional opportunities for water access with tidal restoration, however even Alternative B would improve water access.</p>
3-2	Provide for a variety of uses and user types	4	5	8	<p>No Action: Operations and maintenance budgets may be used to maintain some levees for flood control but unlikely funding for all trail and public access operations, resulting in reduced amount of users accommodated. (Some areas may need to be closed).</p> <p>Alts B-C: Ranked according to increased opportunities for a diversity of recreational uses and visitors.</p>
3-3	Enhance opportunity for aesthetic experiences	3	8	9	<p>No Action: Some levee deterioration would prevent access to certain existing trails that currently provide access to the shoreline, reducing the quality of the visitor experience. Also, deterioration reduces visual appearance in some places.</p> <p>Alts B-C: Ranked according to the changing visitor experience as tidal restoration increases The landscape views and experience will appear less "engineered" within a more naturalistic setting. Large expansive tidal marsh areas with some managed ponds will provide more visual diversity. (A less "homogenized" landscape).</p>

Appendix F – Technical Ratings and Rationale

PUBLIC ACCESS AND RECREATION					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
3-4	Provide regional linkages	5	9	9	<p><u>No Action:</u> No real change from existing conditions.</p> <p><u>Alts B-C:</u> Ranked according to closing gaps in the Bay Trail spine and augmenting connections and visitor enhancements to existing facilities and access along the South Bay.</p>

Appendix F – Technical Ratings and Rationale

WATER & SEDIMENT QUALITY					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
4-1	Improve levels of water quality for total dissolved solids, metals, dissolved oxygen (surface and ground water)	4	7	8	<p>No Action: Limited ability to manage flows in ponds. DO levels will continue to be diurnally depressed because of flow management limitations.</p> <p>Alt B: Pond design and water management will allow for more flexibility in pond operations and the ability to manage flows to improve water quality. Low DO events reduced relative to No Action.</p> <p>Alt C: Wetlands will remove solids. Mature wetland vegetation will take up and store nutrients. Low DO events reduced relative to Alt B. Metals adsorbed to sediments/solids will be deposited in wetlands improving surface water quality.</p>
4-2	Limit ecological risk associated with mercury methylation and bioaccumulation and mobilization of mercury present in sediments	5	8	8	<p>No Action: Low DO levels will increase methylation potential. Limited ability to manage flows to increase DO levels. Mobilization of sediments initially limited but will increase as operations and maintenance of ponds decrease.</p> <p>Alt B: Increased ability to manage flows to reduce methylation. Pond design and flow management will limit exposure and risk. Mobilization of sediments from year 0 to Year 50 higher relative to No Action because of increase in tidal wetlands.</p> <p>Alt C: Higher probability of mobilizing mercury present in sediments from Year 0 to Year 50. Draining of pore water in tidal habitats increases potential for mobilization and bioaccumulation of methylmercury. Design may be able to limit pore water effects.</p> <p>Uncertainties: Cost of implementing mercury management design features may not be compatible with owner financial constraints. Mercury management design features may conflict with other resource management objectives e.g. tidal habitat flow regime.</p>

Appendix F – Technical Ratings and Rationale

NUISANCE SPECIES MANAGEMENT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
5-1	Minimize colonization of mudflats and marshplain by non-native Spartina and its hybrids	6	6	6	<p>All Alternatives: Assume that invasive Spartina will be controlled by the Invasive Spartina Project prior to SBSP restoration.</p> <p>Uncertainty: The effectiveness of the Invasive Spartina Project is unknown.</p>
5-2	Maintain or improve the current levels of vector management	2	3	4	<p>No Action: Significant increase in need for management due to increase in vegetated seasonal wetlands and potential for poor drainage in tidal areas created by unplanned breaches.</p> <p>Alts B-C: Anticipate some increase in need for management with tidal restoration, but more in low-salinity managed (especially seasonal) ponds.</p> <p>Assumption: Mosquito control will be a management issue, and thus all alternatives will have the same level of control (though the cost of control will vary somewhat among alternatives depending on the need for management).</p>
5-3	Improve protection from non-native and nuisance predators and reduce need for predator management	5	5	3	<p>No Action: Some management of mammalian and avian predators expected. Management assumed to be funded at a lower level, but also less necessary, than for Alts B and C.</p> <p>Alts B-C: Assume more funding for predator management than for No Action alt. Need for mammalian predator management will decrease (due to a reduction in predator access to restored marshes after levees are breached), but need for avian predator management will increase (due to concentration of nesting shorebirds and terns into fewer ponds), as the ratio restored marsh to managed pond increases. Avian predator management may be more labor-intensive than mammalian, resulting in decreasing ratings as tidal restoration increases.</p> <p>Assumption: The reduced need for mammalian predator management as tidal restoration increases will likely be more than exceeded by the increase in the need for avian predator management. However, the level of management is expected to increase as the need increases, so that predators will be effectively managed under Alts. B and C even though the rating (which is based on the need for management) declines.</p>

Appendix F – Technical Ratings and Rationale

NUISANCE SPECIES MANAGEMENT					
Criteria Number	Evaluation Criteria	Response to Criteria			Rationale
		Alternative A (No Action)	Alternative B (50:50)	Alternative C (90:10)	
5-4	Minimize colonization by non-native Lepidium	4	5	6	<p>No Action: Ranked 4 (not 5) because Island Ponds may be invaded by Lepidium, and brackish marsh may expand as tidal prism decreases due to sedimentation of South Bay.</p> <p>Alts B-C: Ranked primarily according to (1) the percent of tidal marsh that is brackish (vs. salt marsh), which will decrease as tidal restoration increases (due both to restoration of marsh in currently saline areas and increased tidal prism); and (2) the extent of upland transitional habitat, which will increase with tidal restoration.</p>

* Baseline ISP Conditions = 1 (tidal marsh dependant endangered or special-status species)

** Baseline ISP Conditions = 5

All Alternatives Rated at Year 50

Numbers highlighted in gray are particularly uncertain