South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

Stakeholder Forum Meeting, May 23, 2023

Today's Agenda

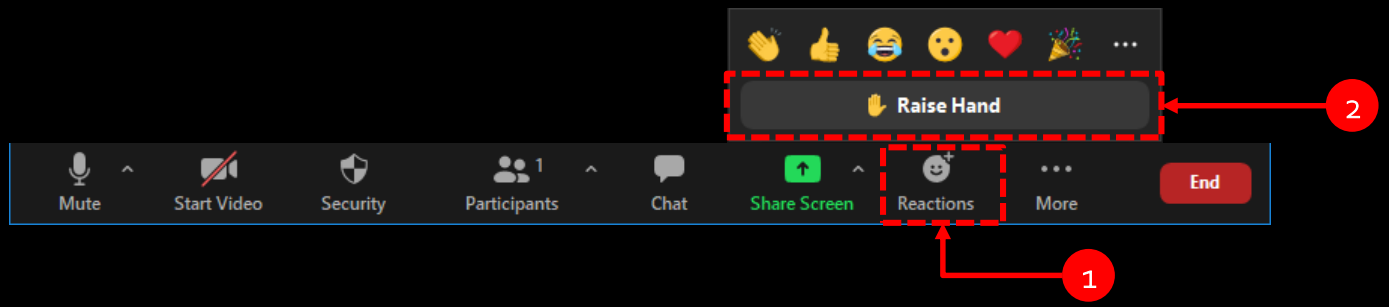
- Introductions of New Team Members
- Restoration Overview
- Phase 2 Work at the Refuge
- *Break*
- Phase 2 Work at Eden Landing
- Collaborations with Outside Projects
- Science Program Updates
- Funding Update
- Wrap-up & Adjourn
- *Optional Q&A Session*

Dialogue Today

- **Approach:**
  1. **Present on a topic**
  2. **Hear from Forum members**
  3. **Hear from public**
  4. **Then shift to next topic**
  5. **We may hold more intricate topics for end of meeting**
- **You can ask questions and provide comments verbally or via Chat**

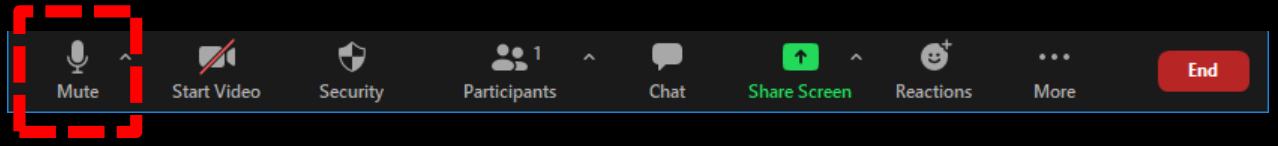
Speaking: Raise Hand for Queue

- On Zoom: Click Reactions, then Raise Hand (*you can try a physical wave too*)
- On phone: Dial *9



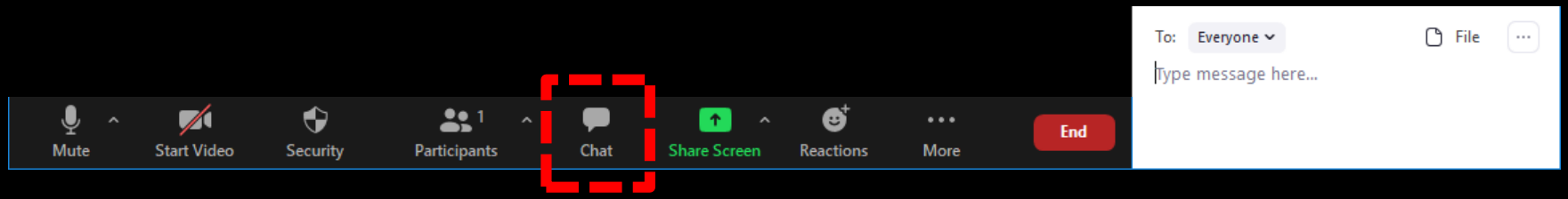
Speaking

- Please remain on mute unless it is your turn to speak
- Mute/Unmute button at bottom left
- On phone: Dial *6 to mute/unmute



Writing your Feedback

- Chat: You can write your questions or comments



Tech Support

- Contact Ariel via text or phone at 510-630-4711
- Or you can use Chat

- Reminder: Meeting is being recorded

How to join our Mailing List

- Type your name and email address in chat (you can Private Chat it to Ariel)

New Team Members

Ann Spainhower, Manager – Don Edwards SF Bay National Wildlife Refuge

Carly White, Manager – Eden Landing Ecological Reserve

Restoration Project Overview

20th Year!

Science-driven restoration

Stakeholder Forum Purpose

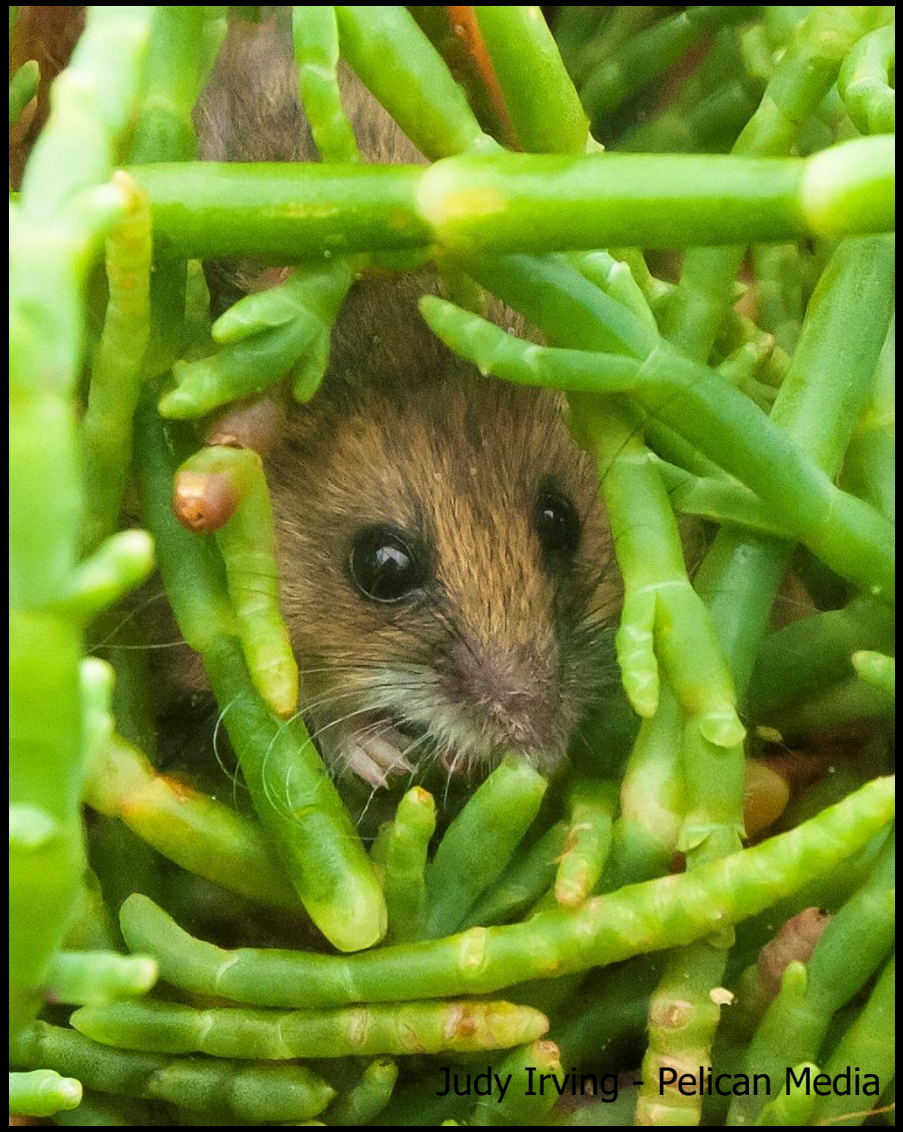
Three Main Goals

1. Habitat restoration
2. Flood risk management
3. Public access & recreation

South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

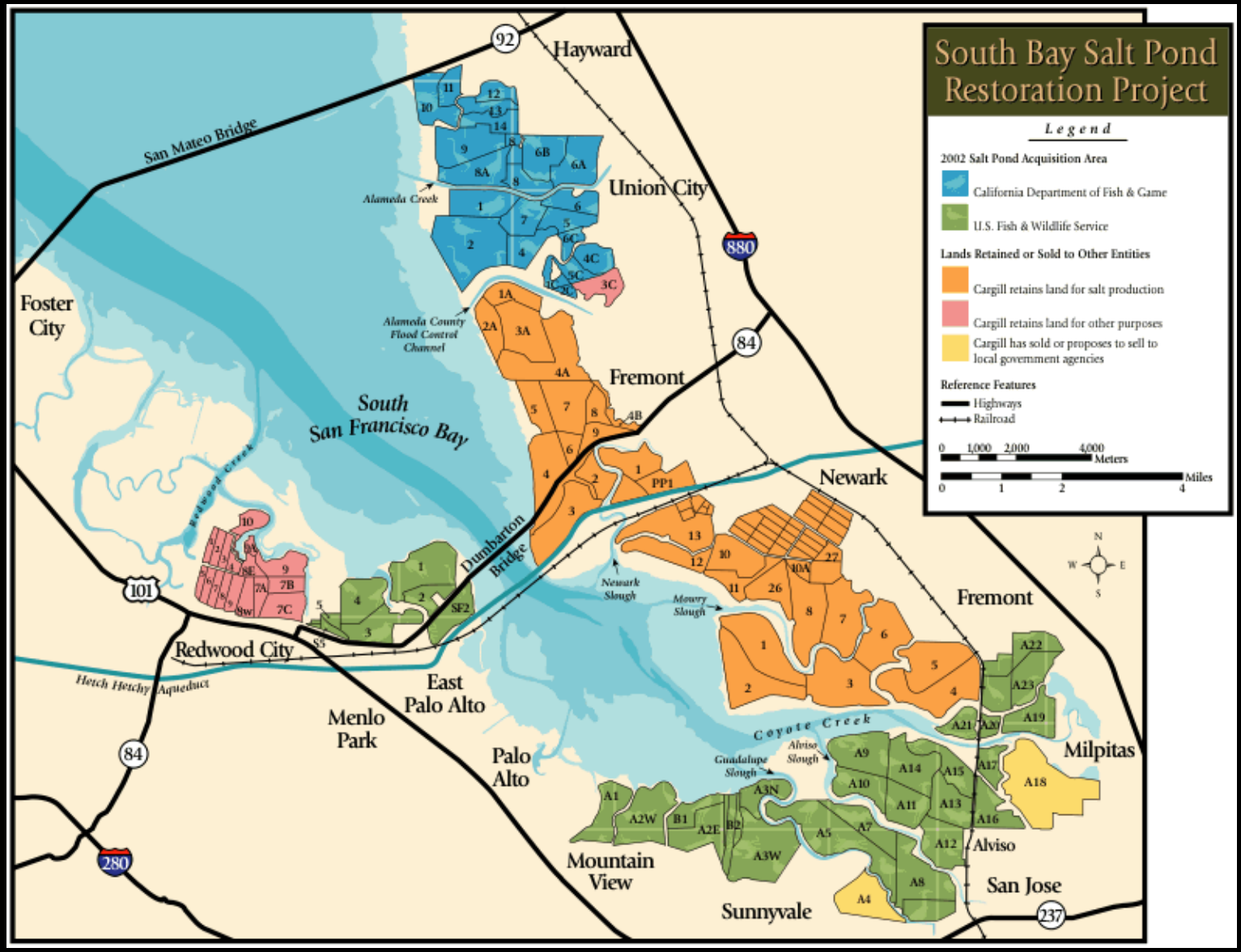
Habitat Restoration



Flood Risk Management

Public Access and Recreation

Project Pond Complexes



Project History

- 2003 acquisition from Cargill, Inc.
- Public and private funds for purchase
- Cargill donated a portion
- 15,100 acres in South Bay

South Bay Salt Pond Restoration Project
Restoring the Wild Heart of the South Bay

U.S. FISH & WILDLIFE SERVICE

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH&GAME

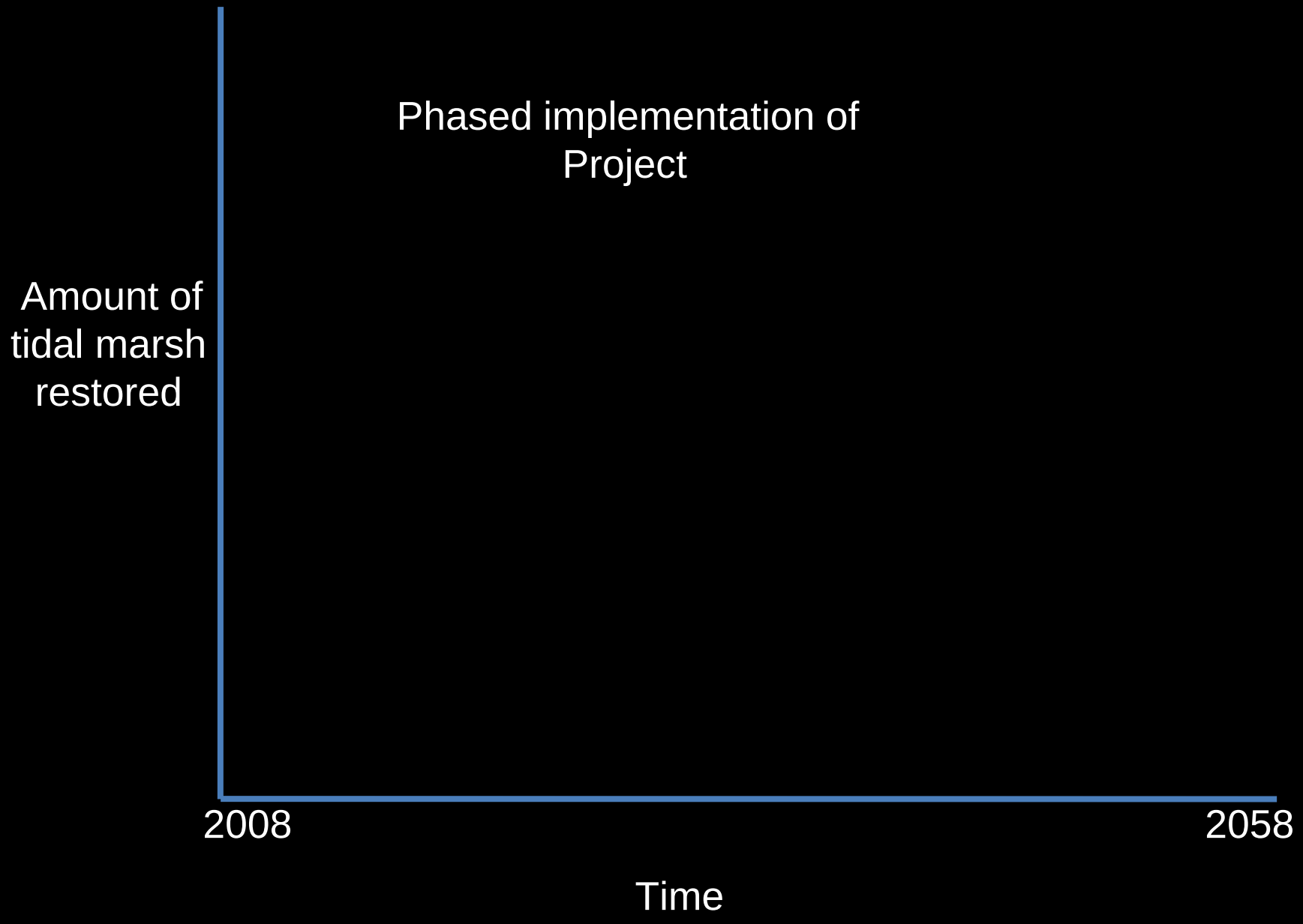
Coastal Conservancy

Cargill

Ecological Trade-offs

Tidal marsh species vs. salt pond species

Adaptive Management Restoration



Adaptive Management Restoration

Phased implementation of Project

Amount of tidal marsh restored

50:50
tidal marsh: ponds

2008

2058

Time

Adaptive Management Restoration

Phased implementation of Project

Amount of tidal marsh restored

90:10
tidal marsh: ponds

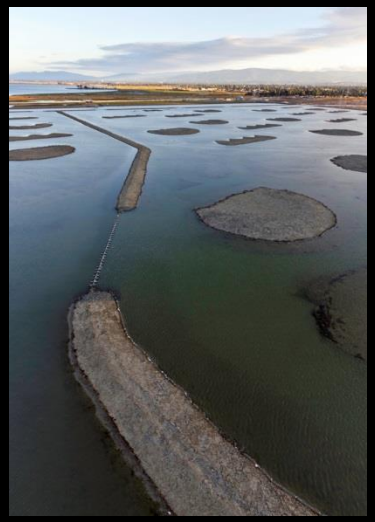
50:50
tidal marsh: ponds

2008

2058

Time

Phase 1 Outcomes



3,000 acres of tidal & muted tidal restoration; 700 acres enhanced managed ponds

Kite photos by Cris Benton

Restored ponds are now home to reproducing endangered species, after less than a decade

Photos: Steve Martarano, USFWS

Public Access

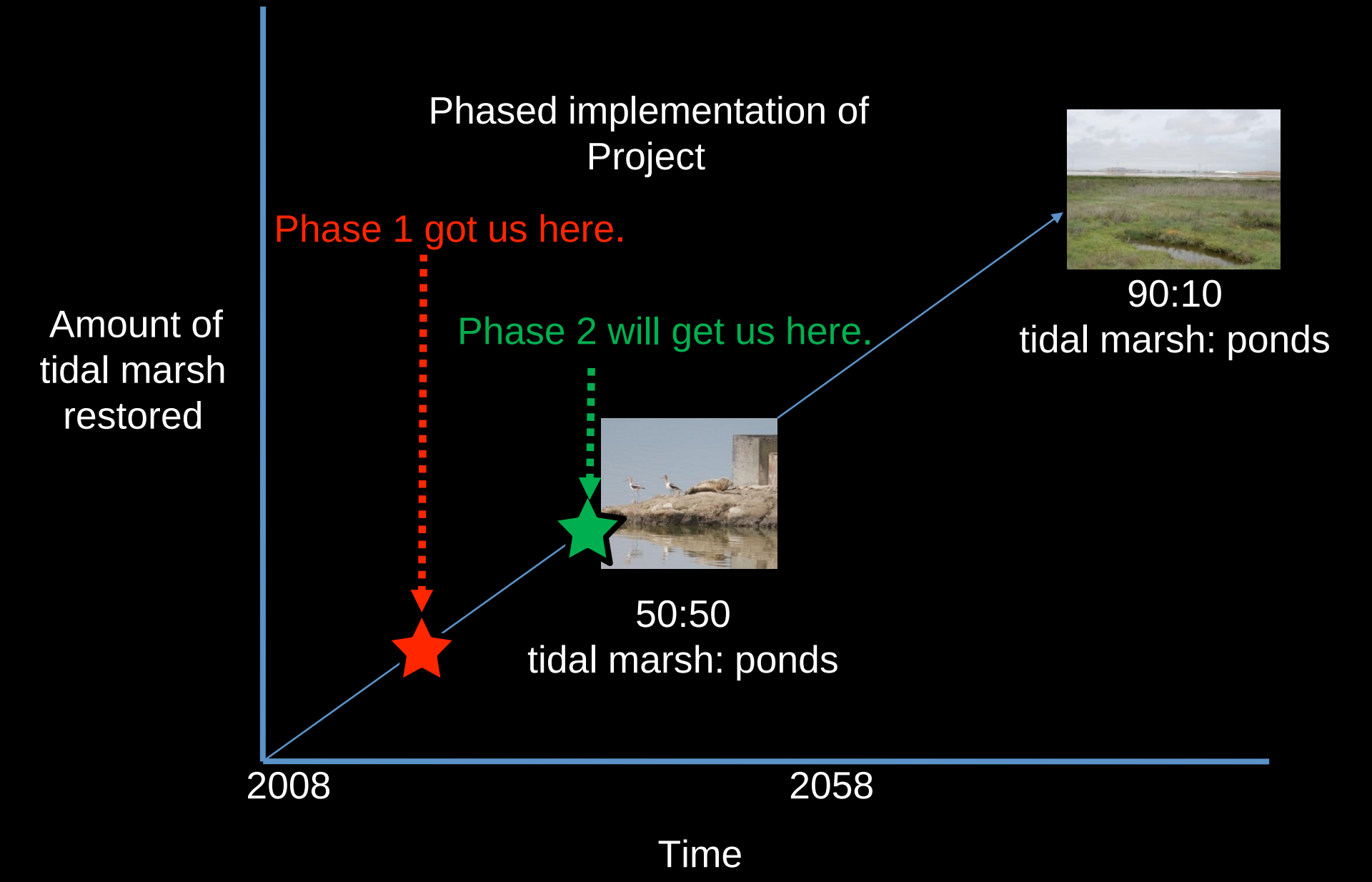
7 miles of new trails

Kayak launch

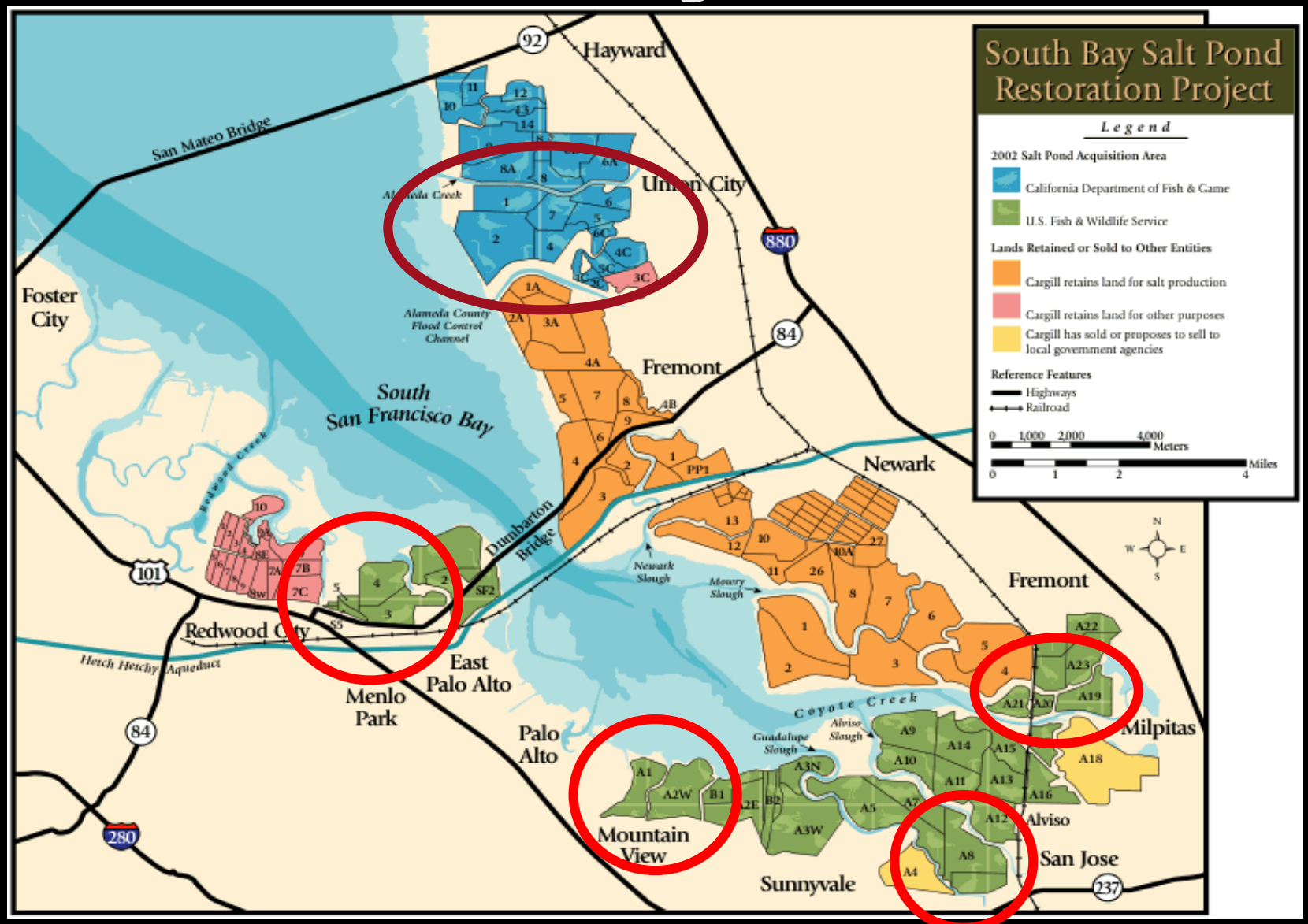
Viewing platforms

Photos: Judy Irving - Pelican Media

Adaptive Management Restoration

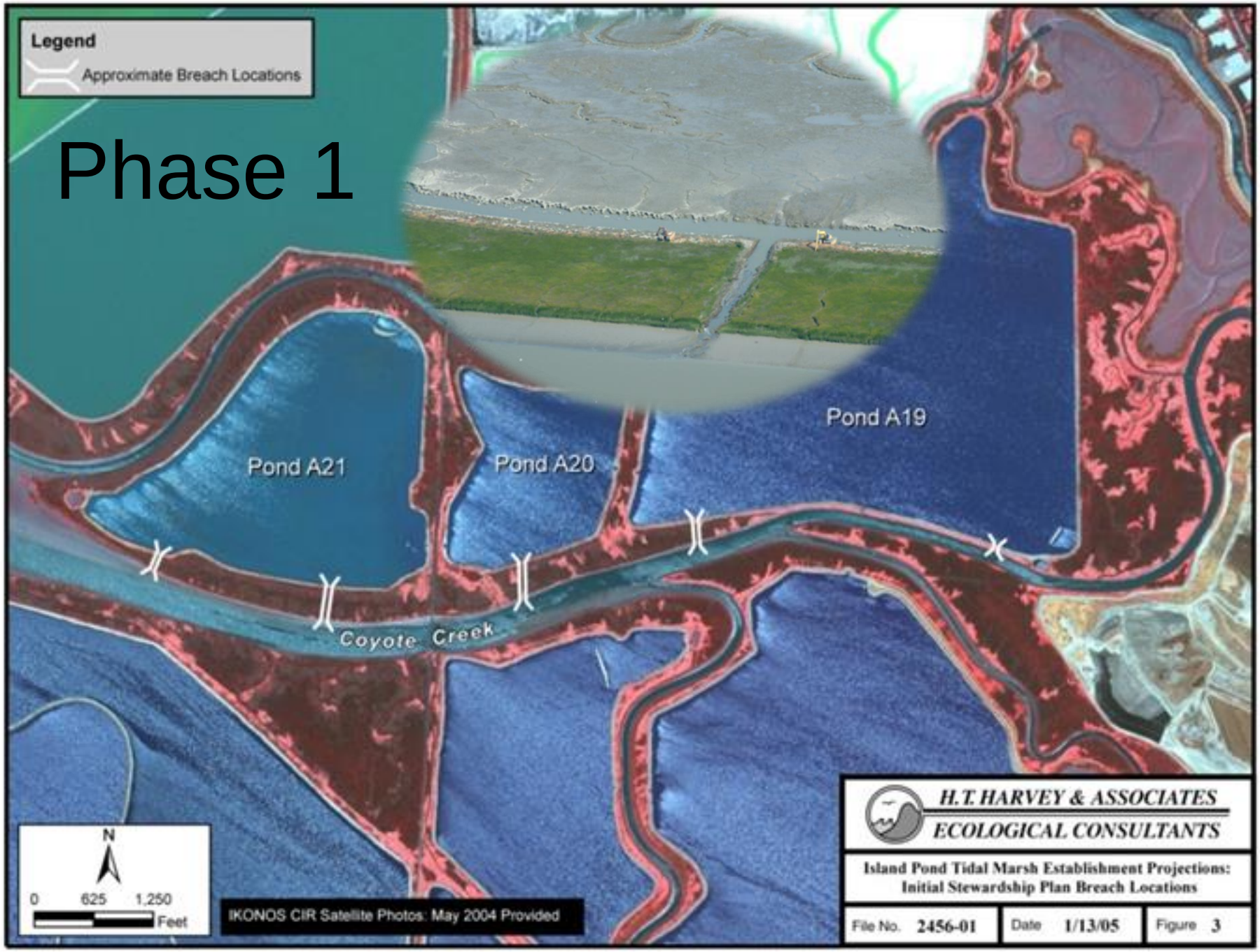


Phase 2 Project Sites



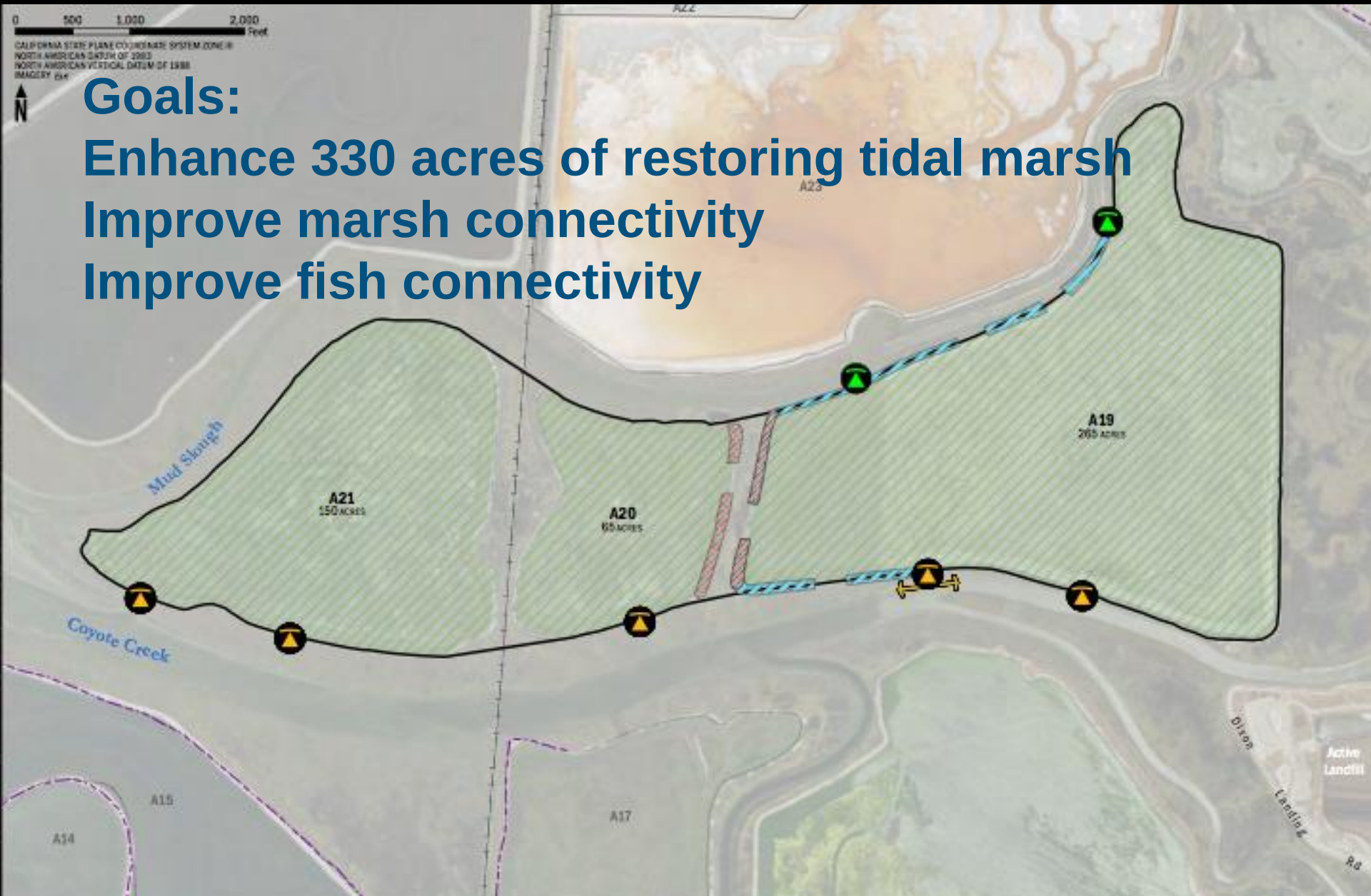
Tracking Our Progress: Phase 2 at the Refuge


0 0.5 1 2 Miles
CALIFORNIA STATE PLANE COORDINATE SYSTEM ZONE III
NORTH AMERICAN DATUM OF 1983
IMAGERY Esri
N
Ravenswood
R5
R4
R3
S5
Alviso
MOUNTAIN VIEW PONDS
C1
A1
A2W
Alviso
ISLAND PONDS
A21
A19
A20
Alviso
A8 PONDS
A8
A8S
84
880
680
114
109
101
82
85
237


Legend
Approximate Breach Locations
Phase 1
Pond A21
Pond A20
Pond A19
Coyote Creek
N
0
625
1,250
Feet
IKONOS CIR Satellite Photos: May 2004 Provided
H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
Island Pond Tidal Marsh Establishment Projections:
Initial Stewardship Plan Breach Locations
File No. 2456-01
Date 1/13/05
Figure 3

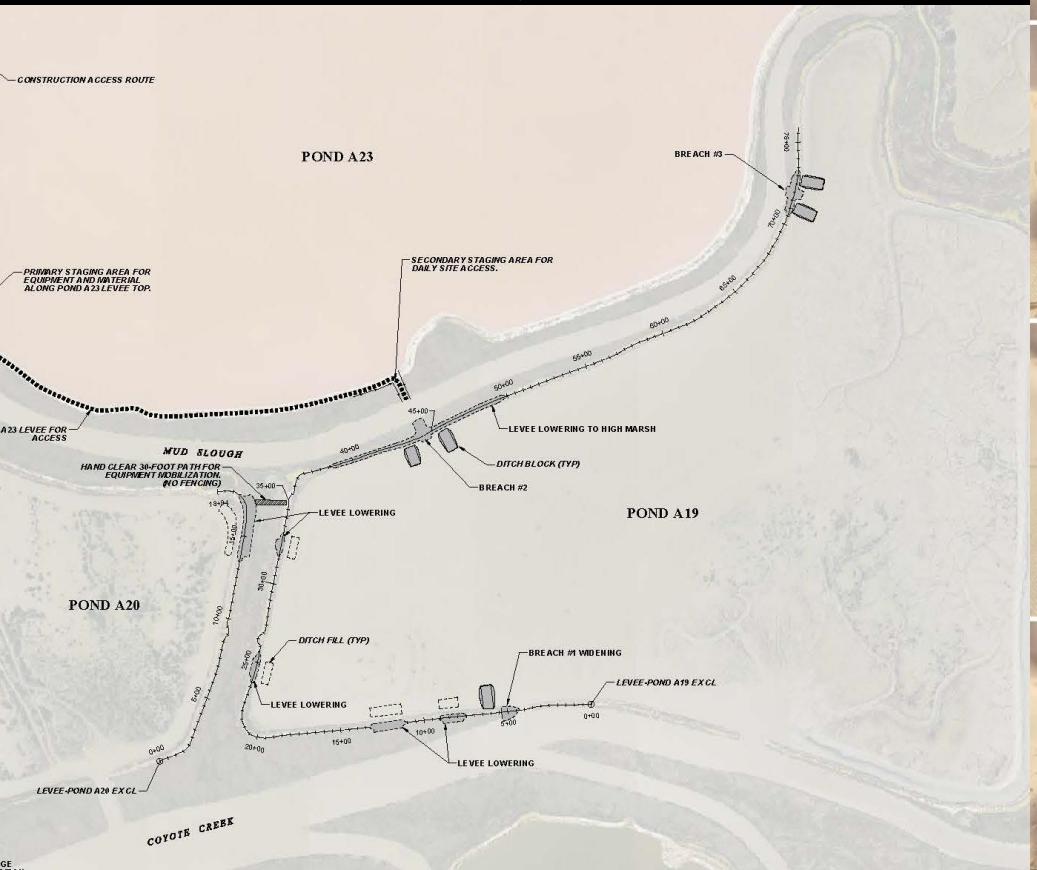
Photos by C. Benton

Phase 2: Island Ponds



Small Mammal Nests

Modified Project

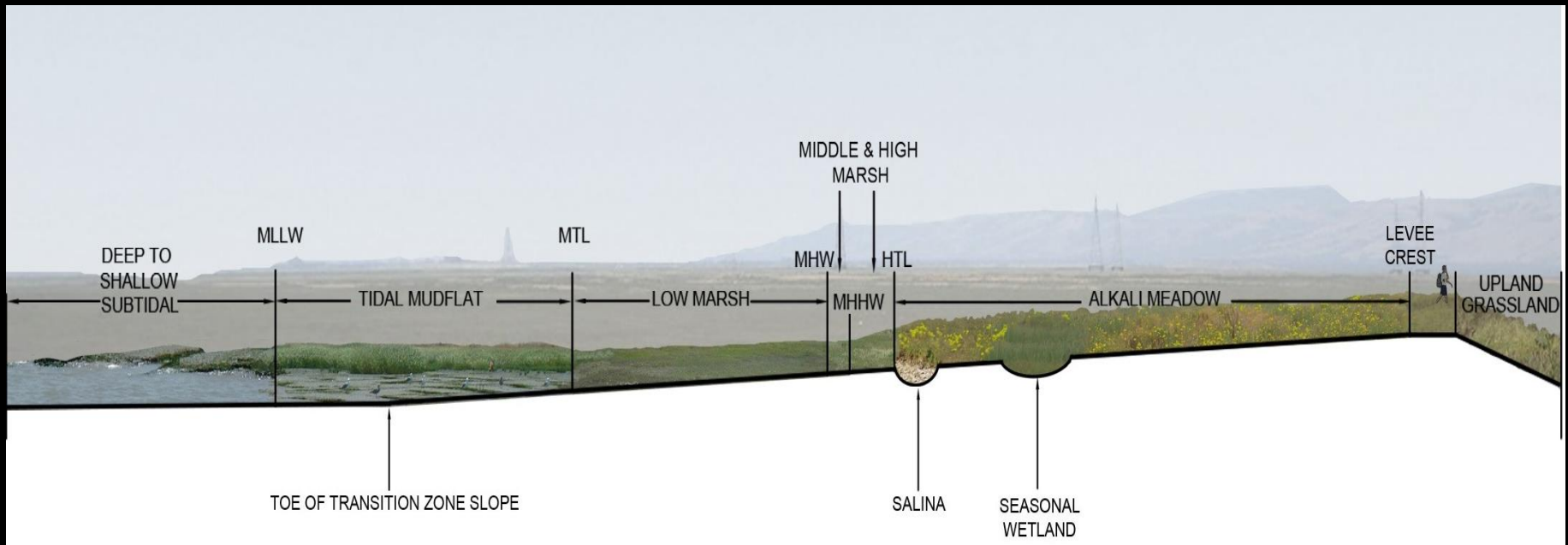



Completed 2022
https://www.southbayrestoration.org/science-symposium-2022
Photos: C. Benton KAP

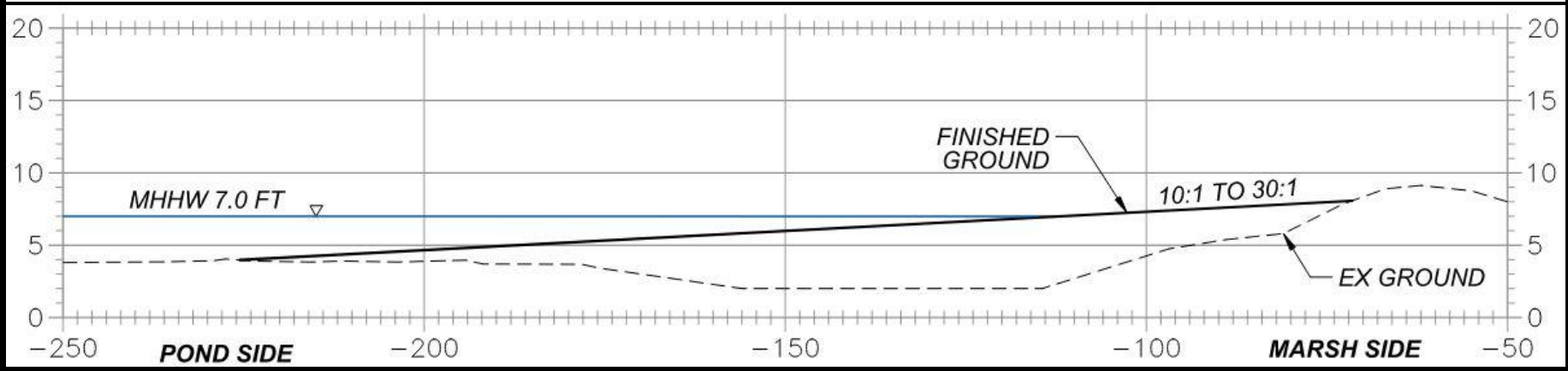
A8 Ponds


0 500 1,000 2,000 Feet
N
Alviso Slough
Guadalupe Slough
A8
410 ACRES
A8S
160 ACRES
Mills St
Elizabeth St
Catherine St
Taylor St
Hedge
Moffat St
N 1st St
Gold St
Guadalupe River
Baylands Community Park
San Tomas Aquino Creek
Great America Pkwy
237

Habitat Transition Zones



Graphic by HT Harvey & Associates



A8 Ponds – This Year

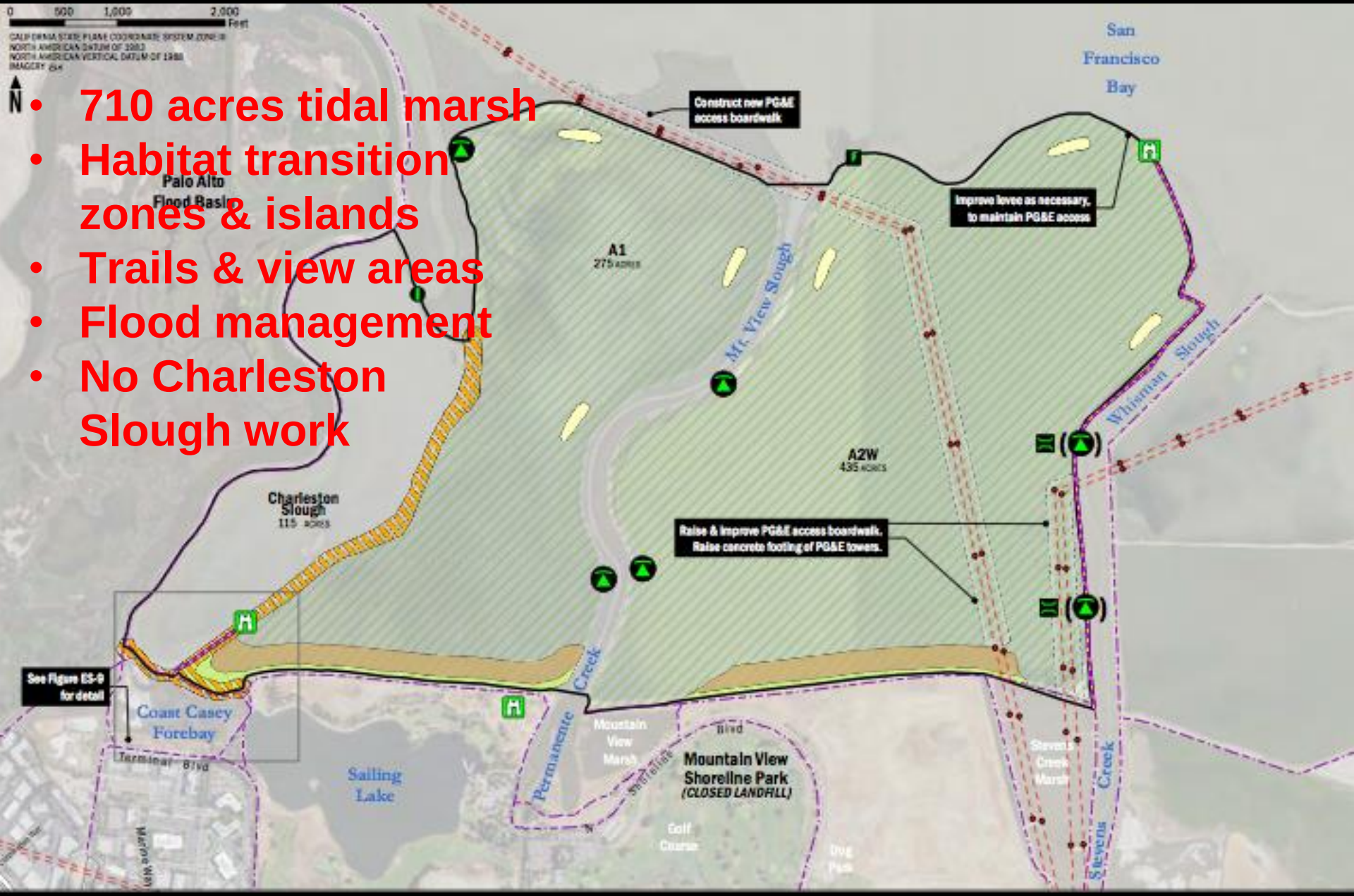
Two habitat transition zones

Leaving room for future creek connections
(More on this later…)

Material imported and stockpiled in place

Construct this year

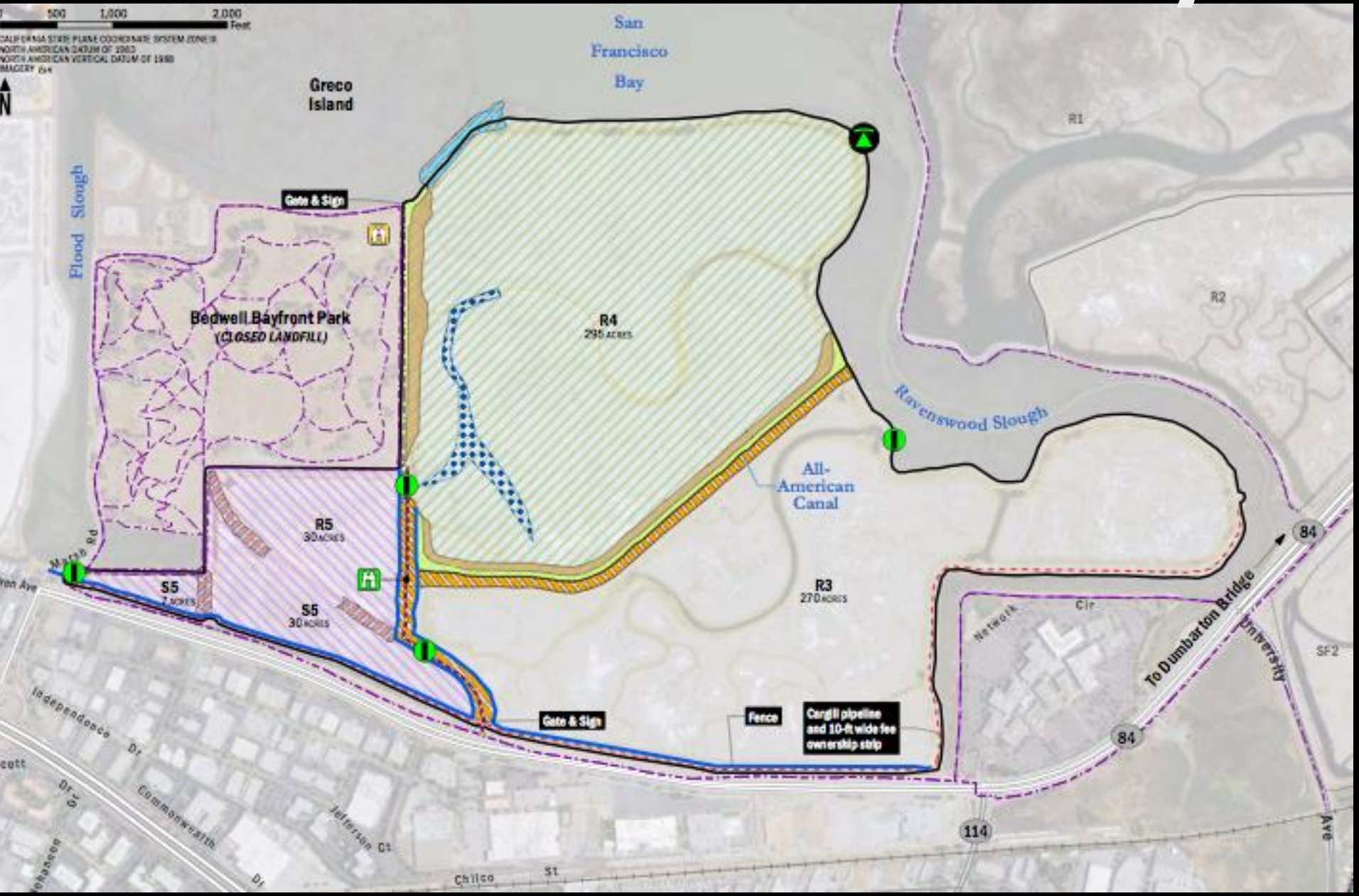
Mountain View Ponds



Phase 2 at Mountain View

- Pond A2W underway; A1 to follow
- Imported ~55,000 cy
- Levee improvements for trail, PG&E use
- PG&E tower foundations almost done
- Easement agreements w/ City settled
- Import & construction → 2-3 years
- Design & clearance for City projects begun
- Breaches & trail thereafter

Ravenswood – Underway



Ravenswood Phase 2 Activities

Ravenswood Phase 2 Activities

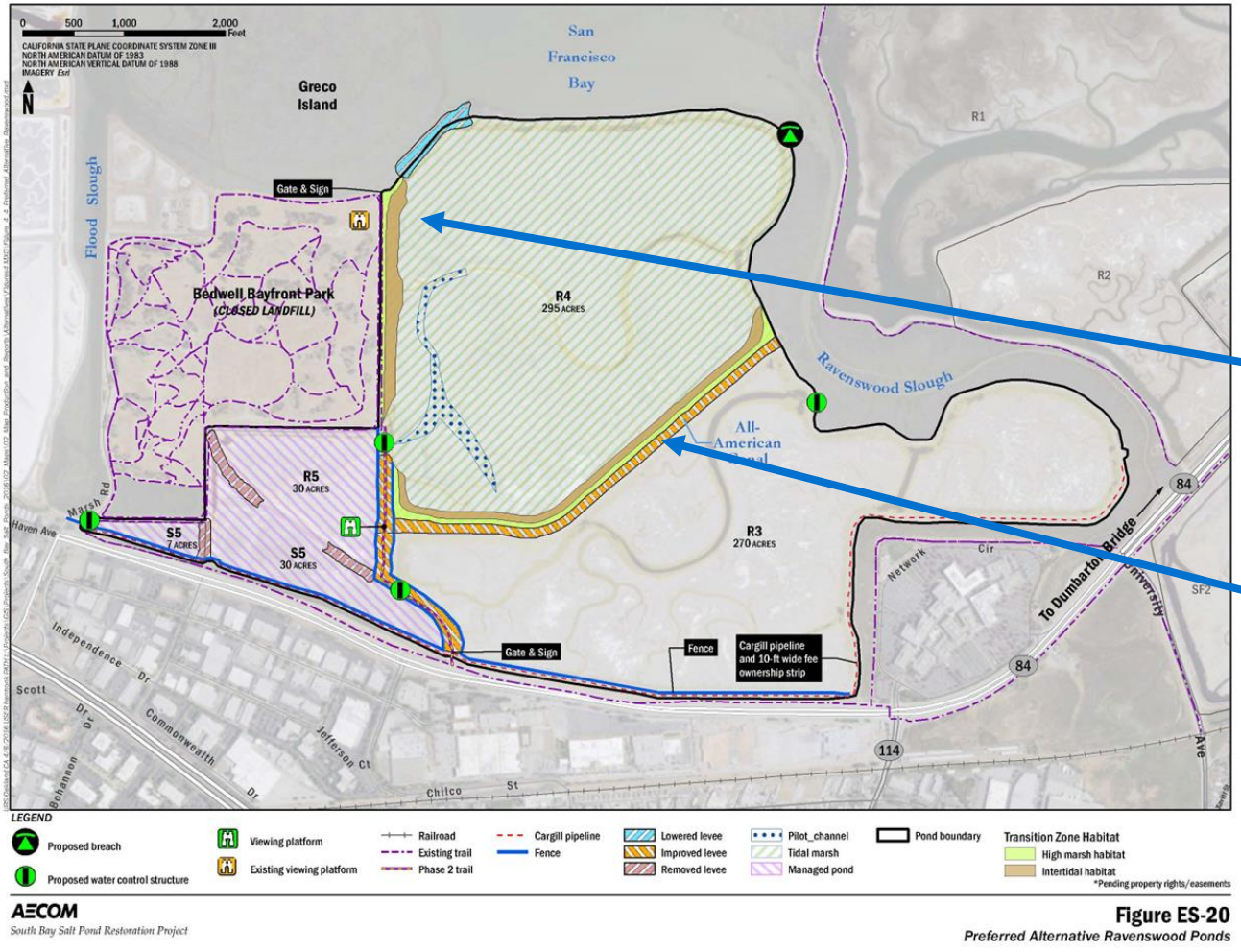
Phase 2 at Ravenswood

- Completed tidal channels & soft ground earthwork
- Installed 4 water control structures
- Raised almost all of Habitat Berms imported all but ~20,000 cubic yards
- Built & planted 1st habitat zone
- Completed Bayfront Canal & Atherton Channel Project coordination – used this winter – more later!

Phase 2 at Ravenswood

- Complete remaining dirt import
- Finish remaining berm raise
- Breach Pond R4
- Plant the 2nd habitat zone this winter
- Add trail & viewing area next spring
- Interpretive content development w/ Ramaytush Ohlone
- Community engagement

Ecotone Revegetation around Pond R4



- On-site division bed nursery
- 25 acres total
- 9 acres Bedwell Bayfront ecotone
  - Planted year one fall 2021-spring 2022
- 16 acres All-American Canal ecotone

SAVE THE BAY

SAVE THE BAY

Upcoming

- Invasive species removal
  - Spring 2023-fall 2023

- Outplanting
  - Fall 2023-spring 2023
  - Mechanized revegetation -> annual seed mix ->biodiversity and container plantings

- Volunteer and community engagement
  - Ongoing

Save The Bay's Volunteer Events Calendar
savesfbay.org/calendar/

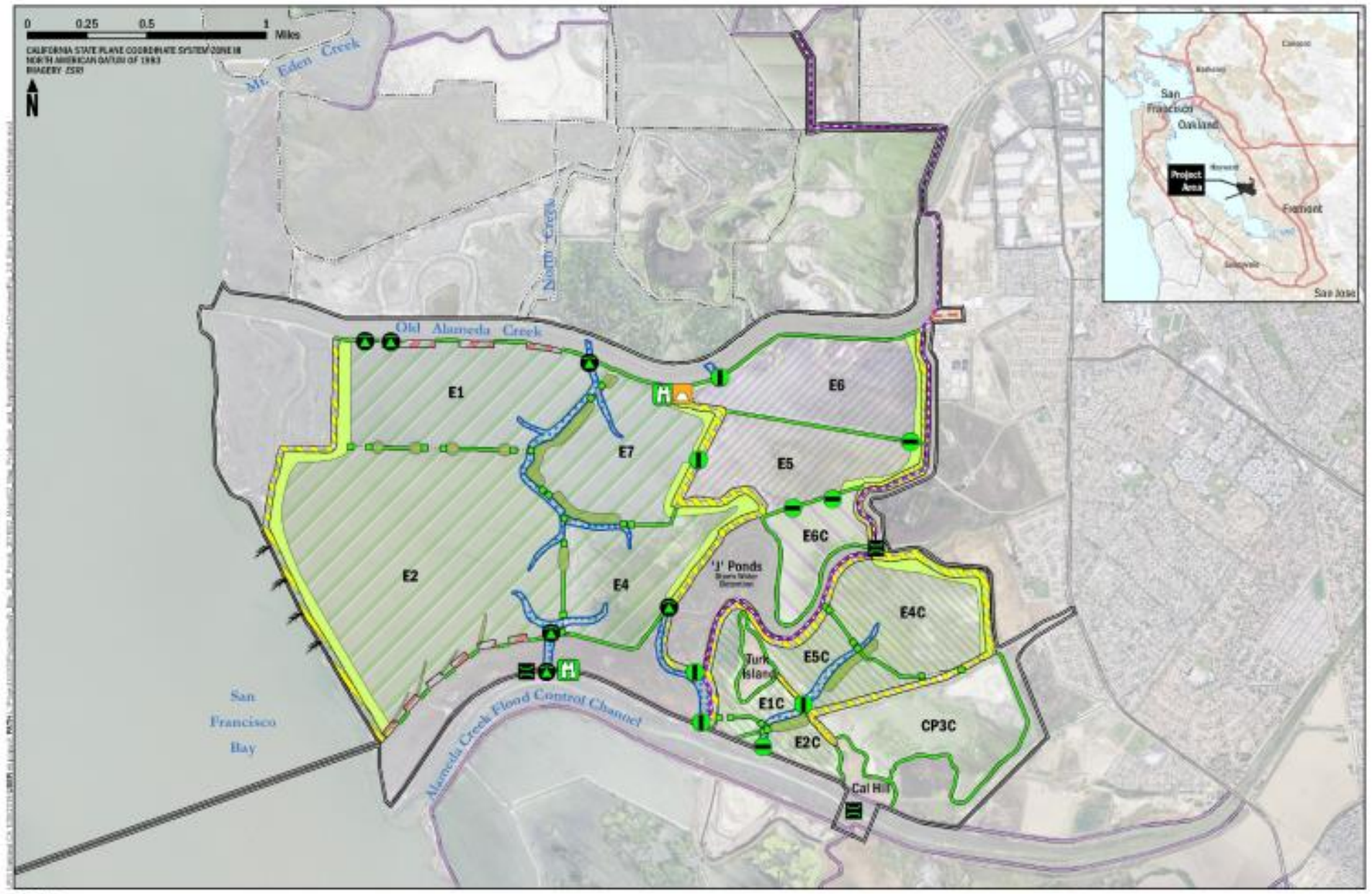
15-Minute Break

Volunteers at Eden Landing: San Francisco Bay Bird Observatory
Snowy Plover habitat enhancements work party.
Photo by Ivan Parr

Tracking Our Progress: Phase 2 at Eden Landing

Phase 2 at Eden Landing

Phase 2 at Eden Landing



Phase 2 at Eden Landing

- 1,375 acres of tidal marsh along the Bay
- 445 acres of enhanced managed ponds
- 450 acres of muted tidal restoration

American Avocet; PRBO

Salt marsh harvest mouse; Judy Irving

Phase 2 at Eden Landing

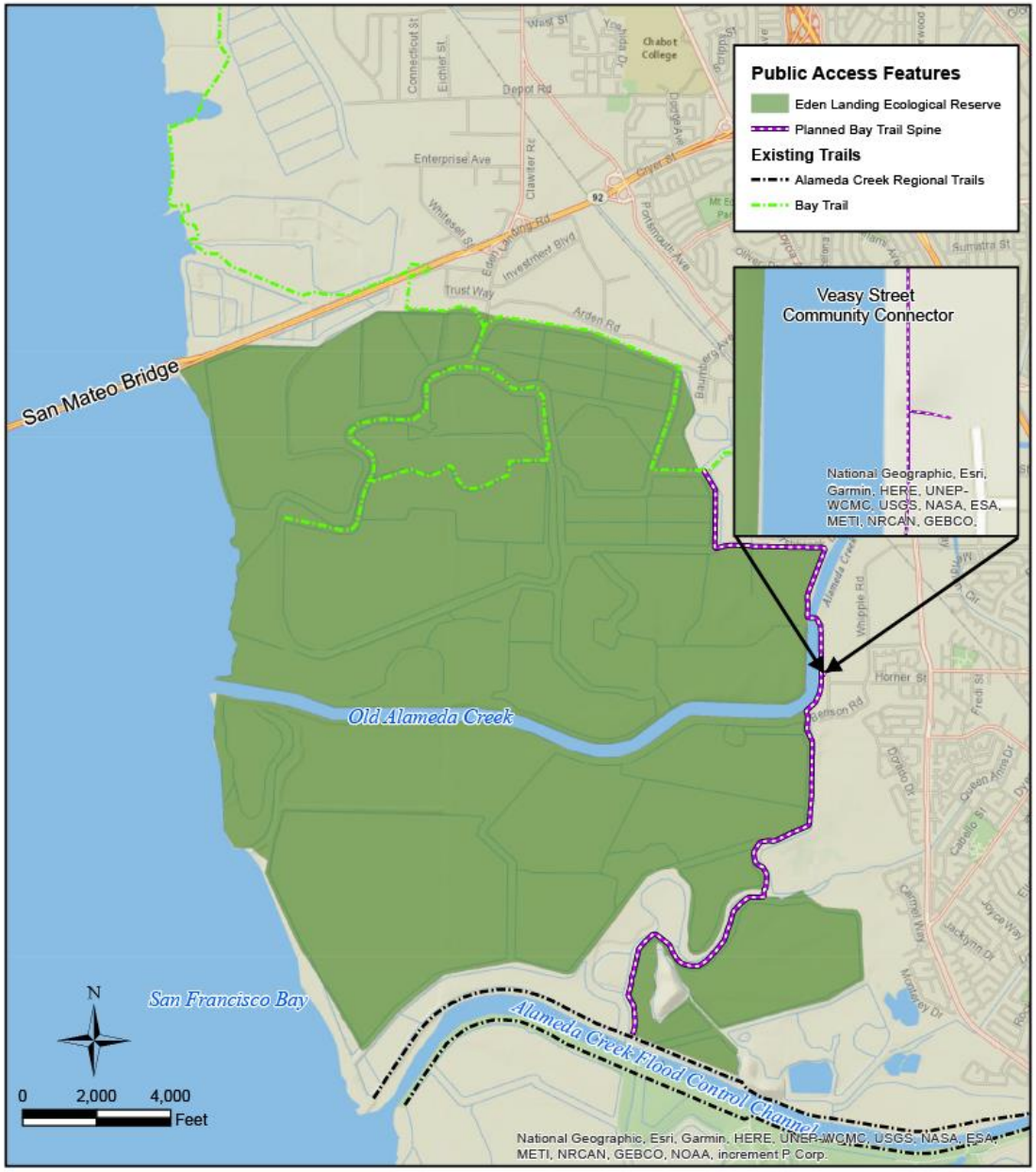
- Flood risk management improvements
- Habitat transition zones
- Stormwater management features for Flood Control District

.

Mt. Eden Creek; Chris Benton

Public Access

- Bay Trail spine (~4 miles)
- Bay Trail design standards
- Community connection trail
- Viewing platforms with benches, signs
- Retain existing public access

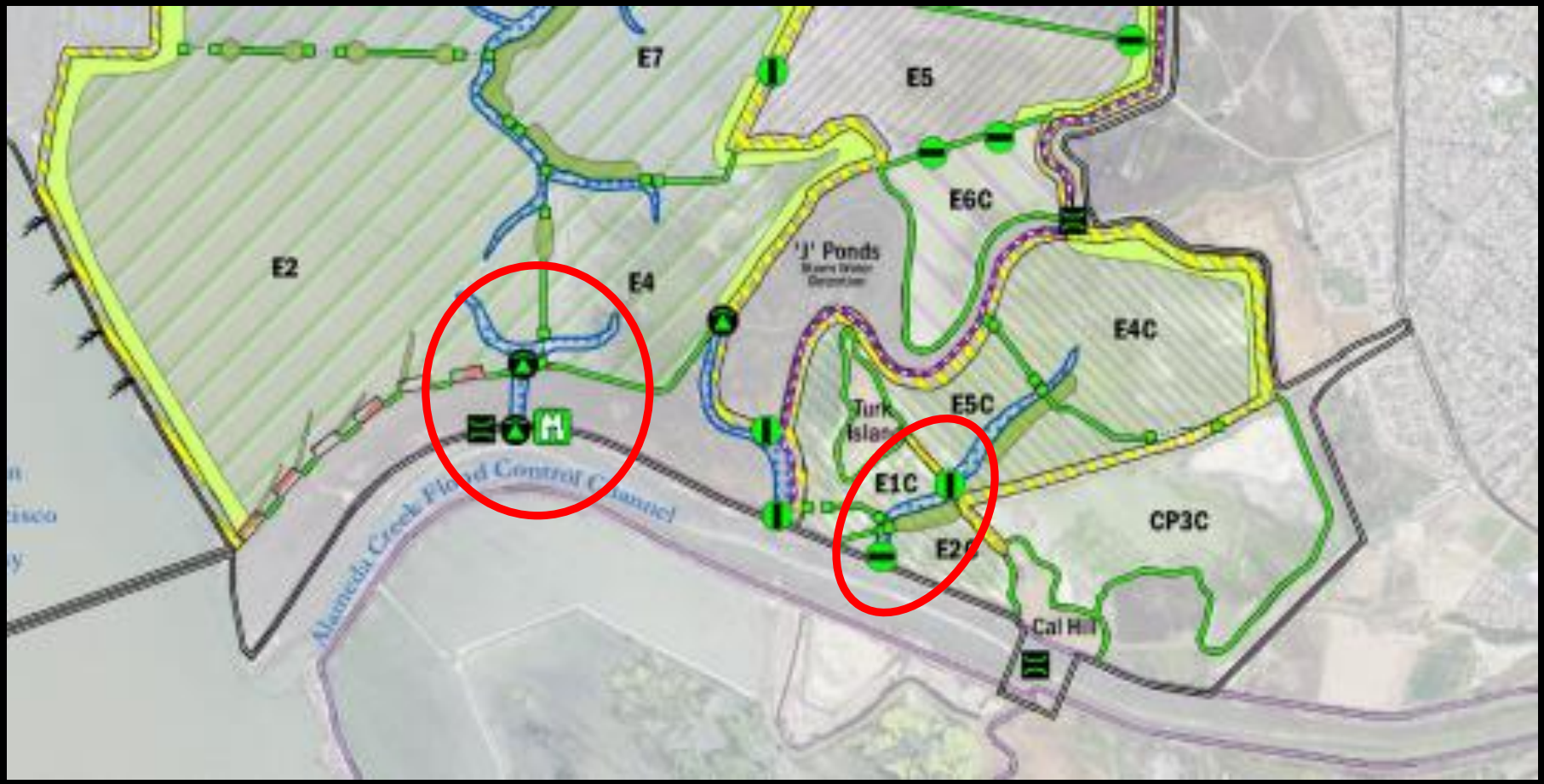


Phase 2 at Eden Landing

- Staged implementation
  - Stage A – ***Most*** project elements
  - Stage B – All connections to Alameda Creek Flood Control Channel
- Stage A design & permitting underway
  - 60% designs done
  - Permit applications submitted
  - Flood Control District reviewing now
- Construction to follow in 2024

Phase 2 – Stage A

Stage B



- Increasing muted tidal circulation in Southern Ponds
- Adding habitat connections to Flood Control Channel
- Enhance Bay Trail connection to Regional Trail

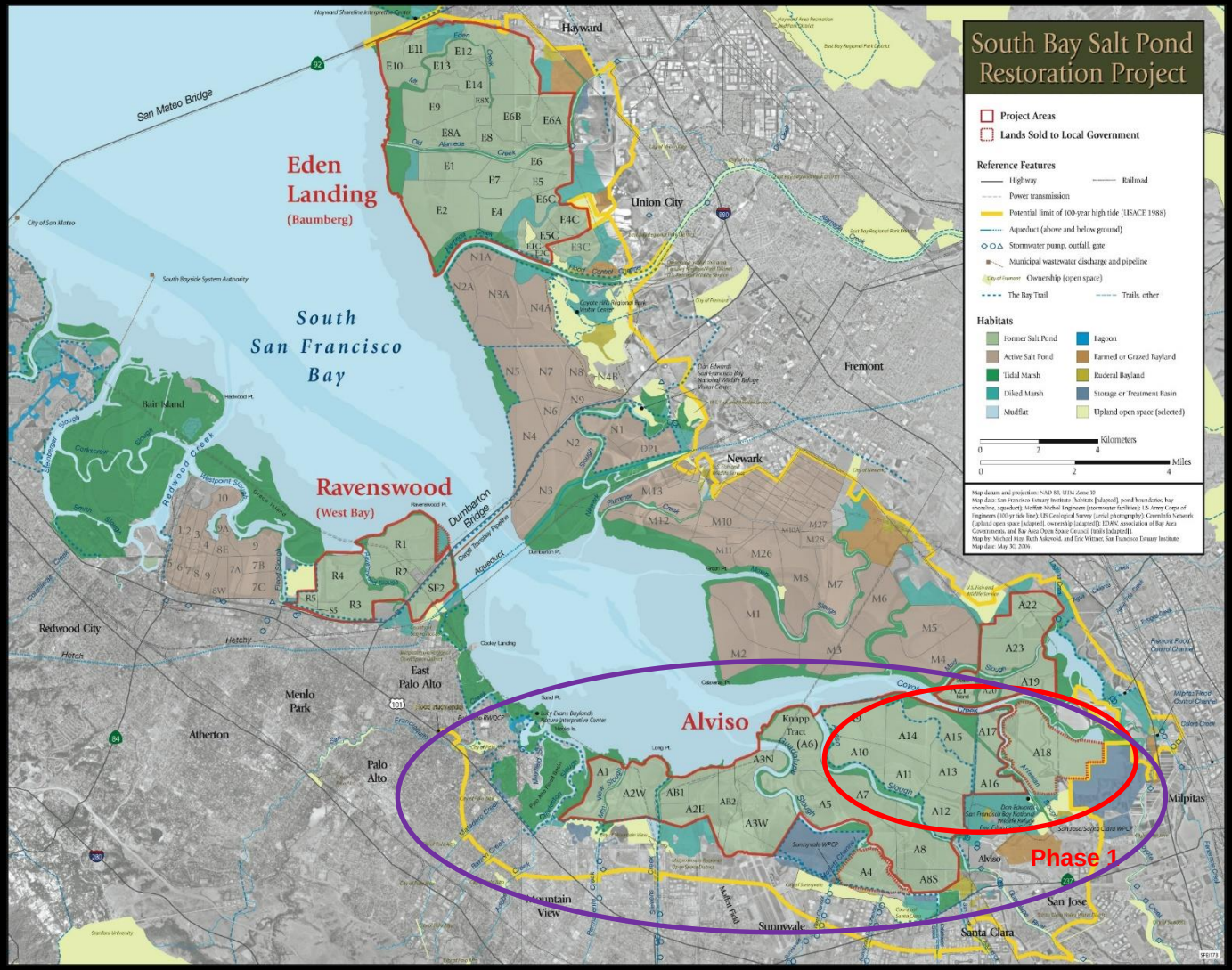
Eden Landing Phase 2 Ponds Pre-Construction

Kite Photos by Cris Benton

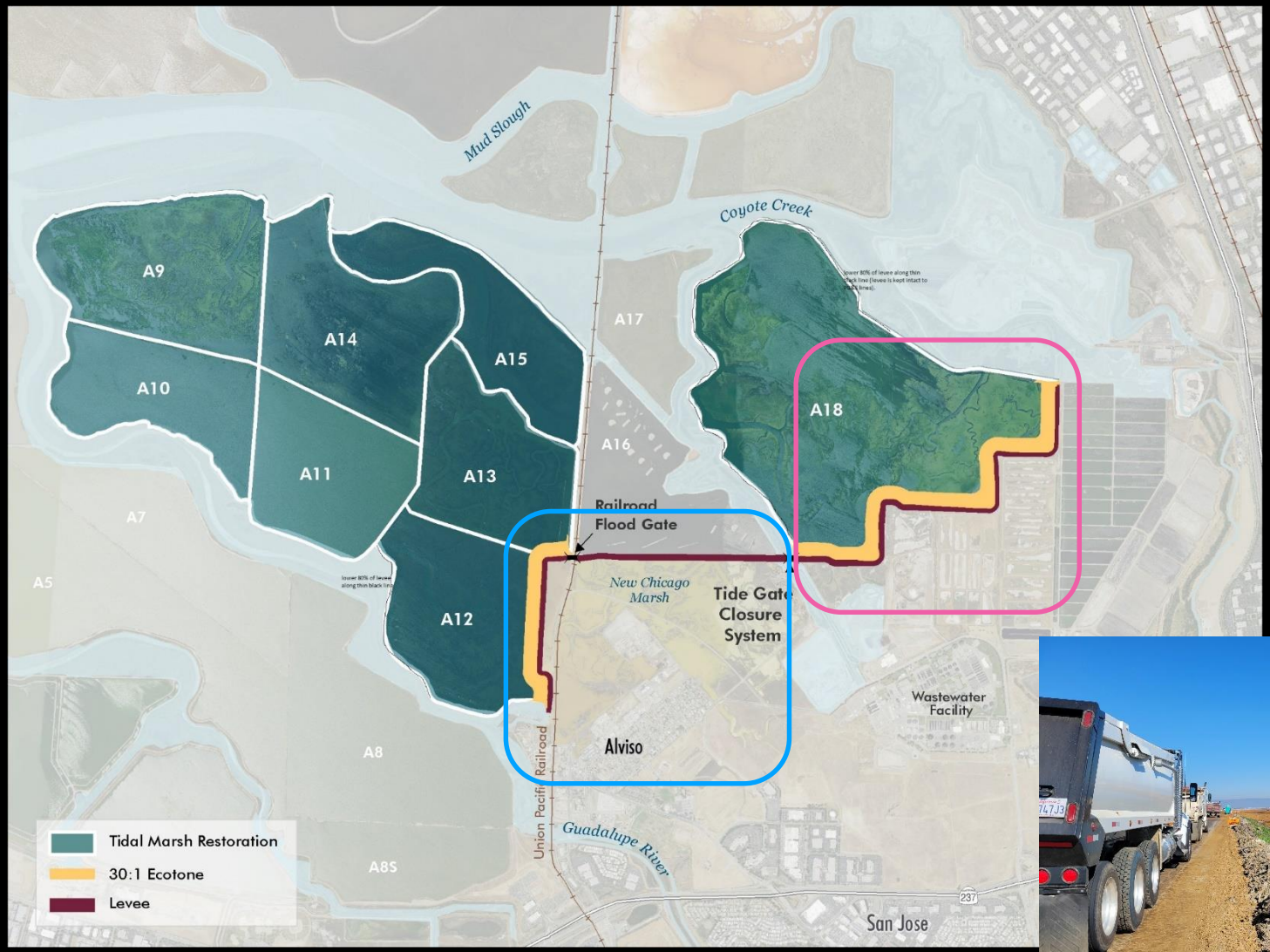
Collaborative Projects

Cris Benton

South San Francisco Bay Shoreline Project



Shoreline Project Phase 1



Habitat Restoration

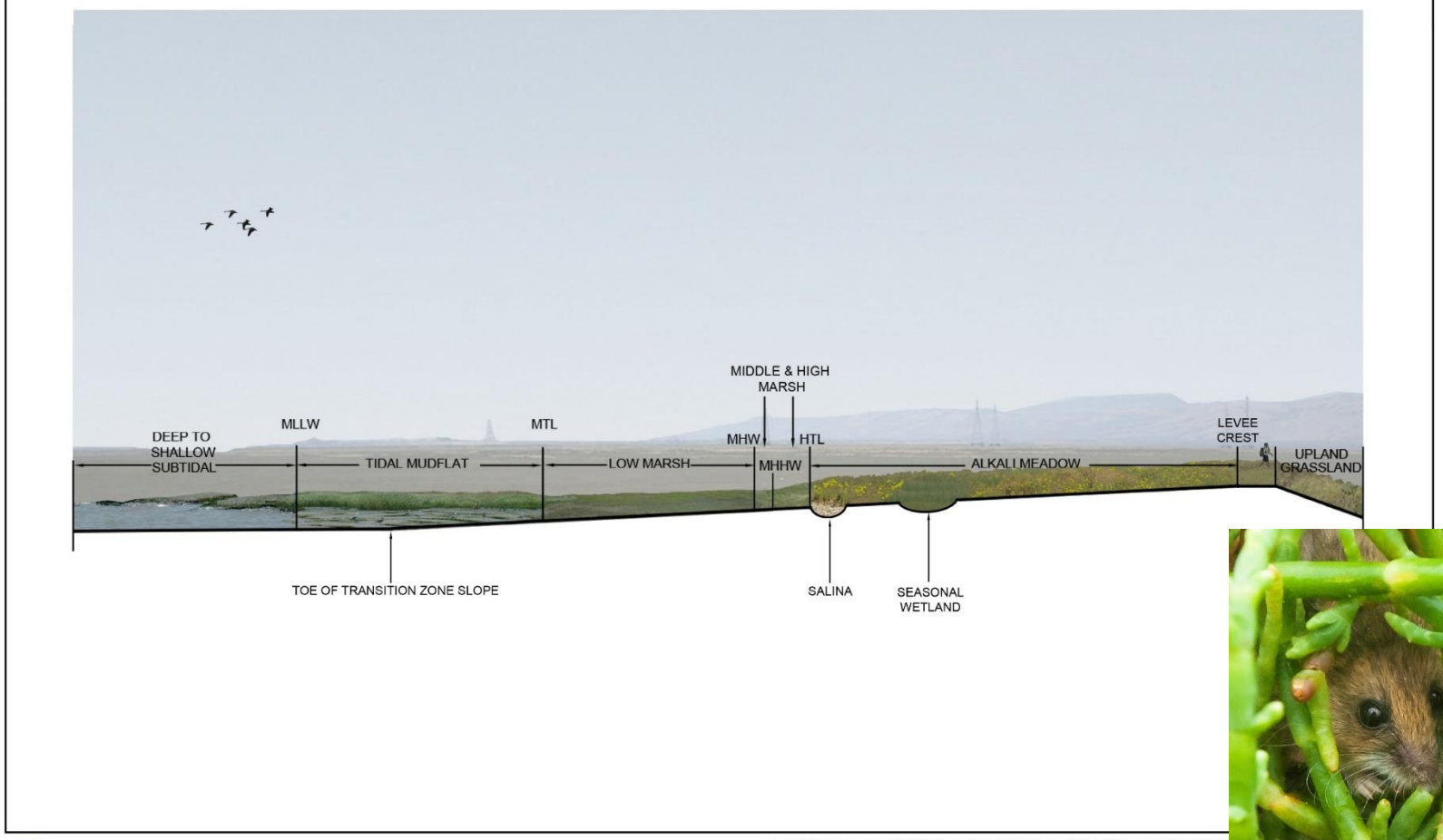


Photo: Judy Irving

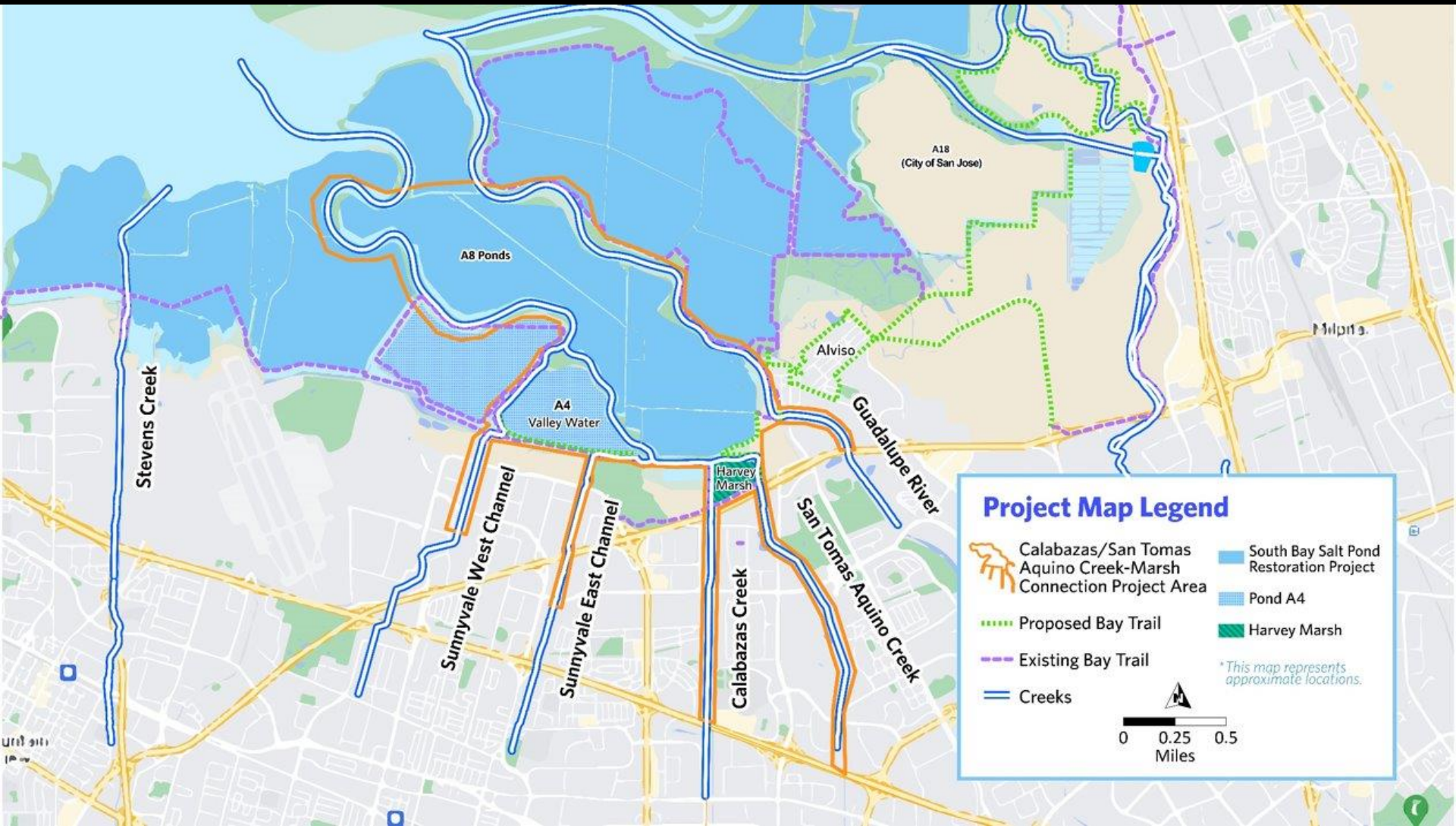
Phases 2 & 3

"Sunnyvale Shoreline Resilience Vision" by SFEI and City of Sunnyvale

Thank You!

For any questions:
Shalini Kannan
shalini.kannan@scc.ca.gov

With Valley Water in Alviso: Calabazas/San Tomas Aquino Creek - Marsh Connection Project



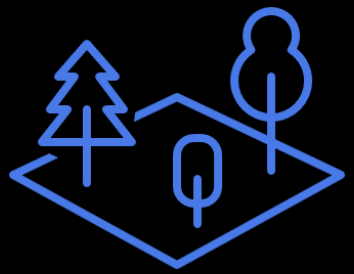
Calabazas/San Tomas Aquino Creek - Marsh Connection Project

PROJECT OBJECTIVES

HABITAT RESTORATION

RESILIENT FLOOD PROTECTION

REDUCE MAINTENANCE NEEDS



ENHANCE PUBLIC ACCESS

With Valley Water in Alviso: Calabazas/San Tomas Aquino Creek - Marsh Connection Project

NEXT STEPS

Alviso Pond A12, FWS Refuge

Photo: Tim Tidwell

Other Outside Collaborations

- San Francisquito Creek JPA: SAFER Bay
  - long-term planning and coordination

- One Shoreline: Bayfront Canal & Atherton Channel
  - Completed and operating
  - One Shoreline's Colin Martorana to present

After Phase 2 & Collaborative Projects

May 23, 2023

South Bay Salt Pond Restoration Project Stakeholder Forum

San Mateo County Flood and Sea Level Rise Resiliency District

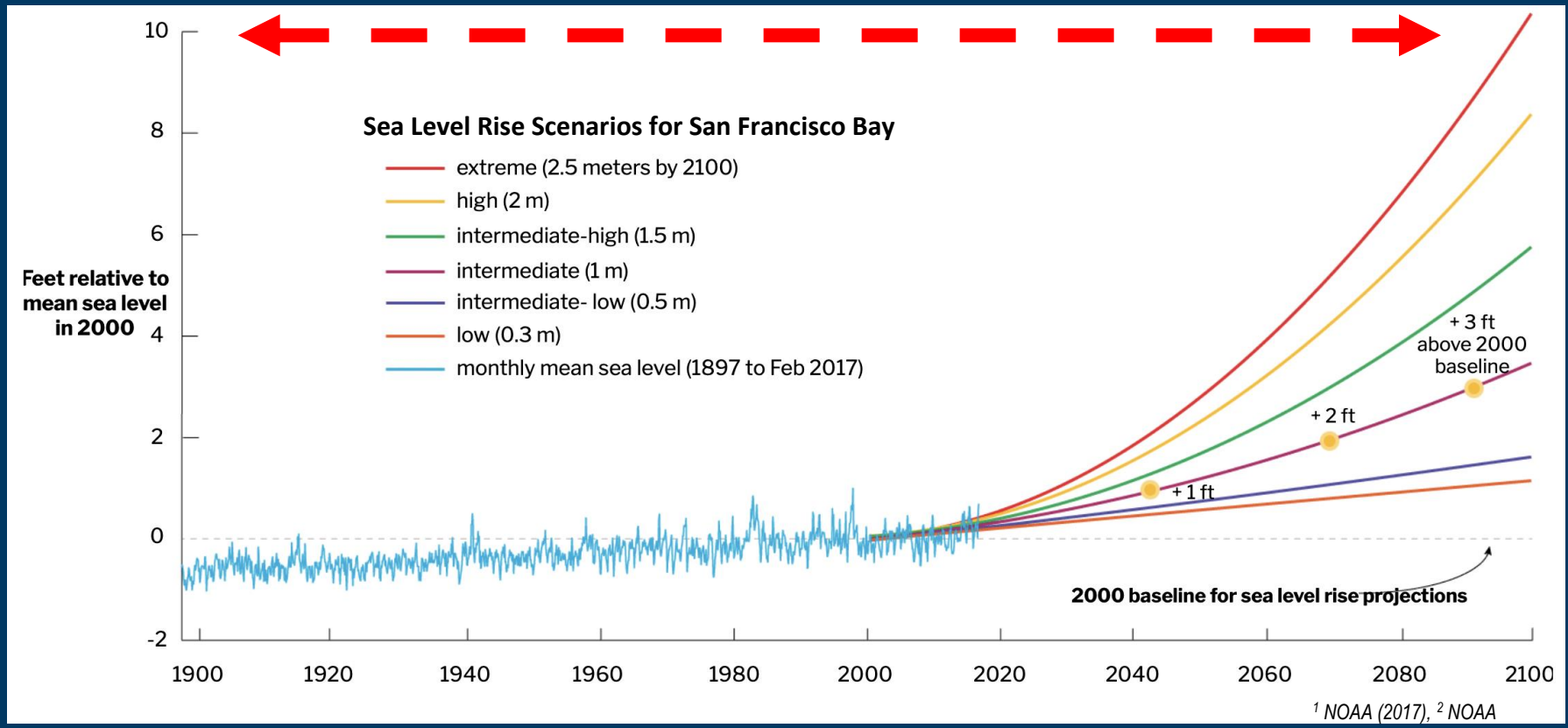
Colin Martorana

info@OneShoreline.org

OneShoreline
Building Solutions for a Changing Climate

Historic average sea level rise in San Francisco Bay has risen 1” every 15.6 years [1]

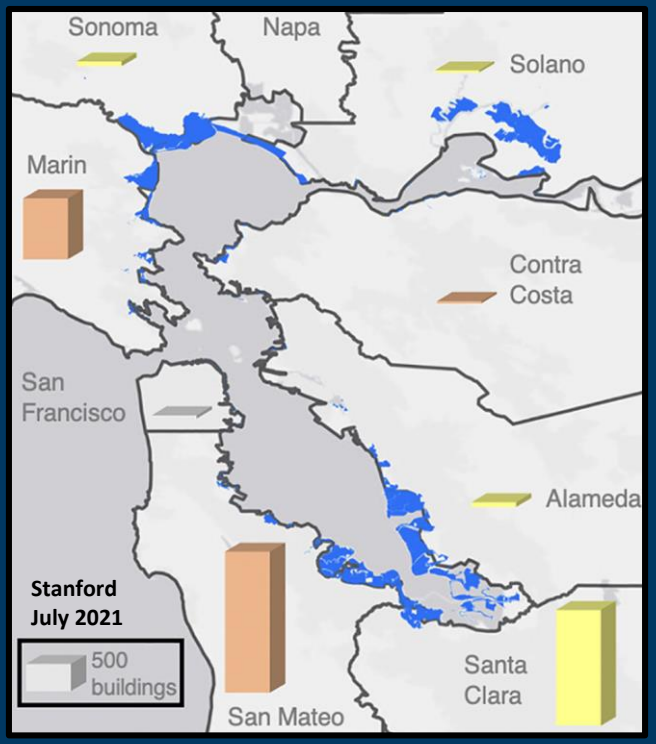
Projected average sea level rise is expected to increase to 1” every 3.8 years [2]



[1] NOAA (2017), [2] NOAA (2022)

Most vulnerable CA county to 3 feet of sea level rise:

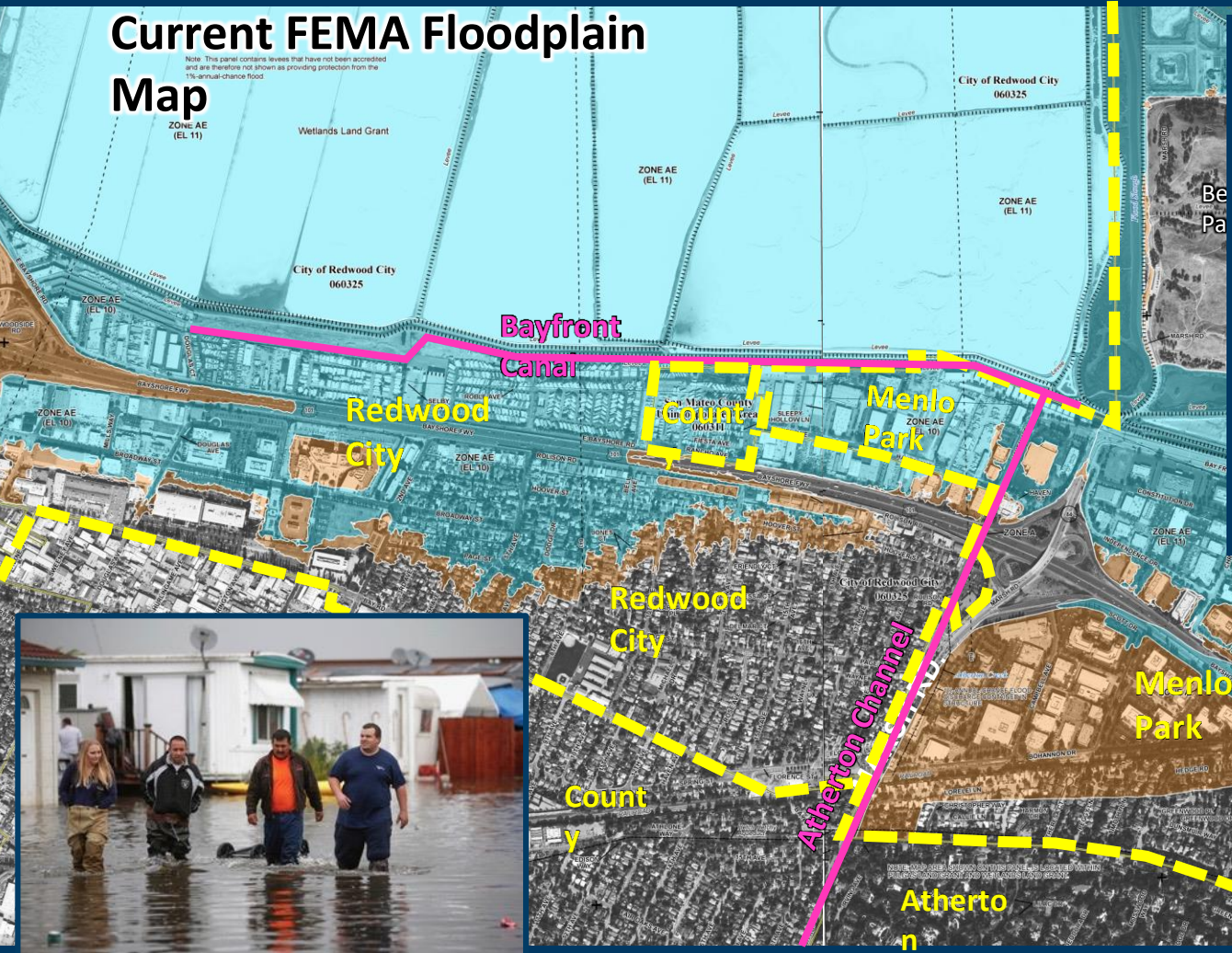
- **100,000 people, including under-resourced population**
- **Number of homes and contaminated sites**
- **Property value**



Climate change is a transformative challenge the County and cities were not individually well-positioned to address.

State legislation established OneShoreline on Jan. 1, 2020 as the first independent government agency in CA to build regional resilience to the water-related impacts of climate change: flooding, SLR, coastal erosion, stormwater, water supply, and recreation and the environment.

Current FEMA Floodplain Map



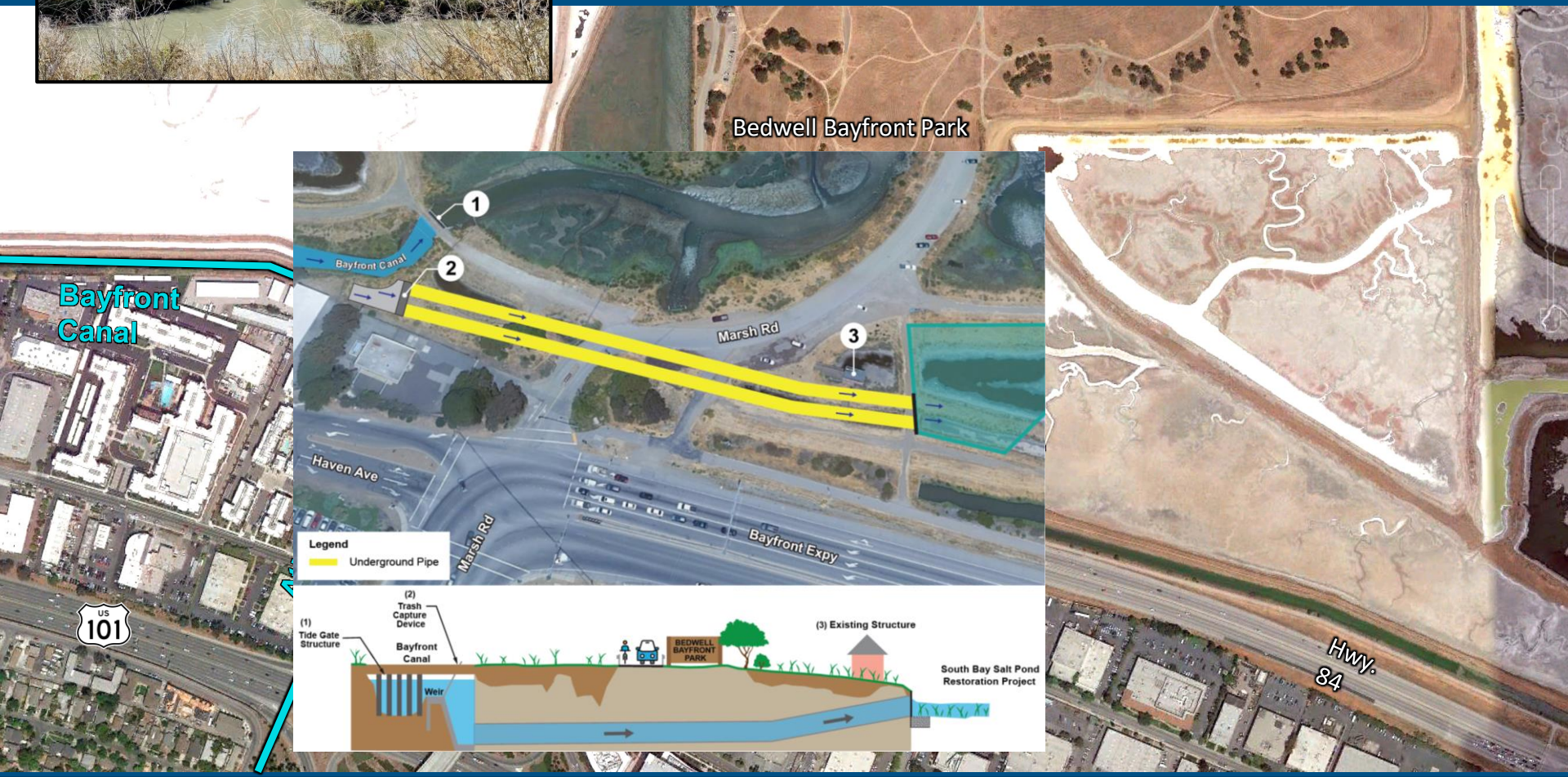
40 significant flood events over the last 70 years

Consequences

- Public health and safety
- Street closures
- Property damage
- Economic impacts to jurisdictions
- Regional emergency response required and hindered

> Project planning began in 2012

Project overview



The major storms of December 2022 to March 2023

- California went from the three driest years on record to the three wettest weeks on record
- Nine diversions occurred during this time, with no reported incidents of Canal overtopping
- As sea levels rise, this flood mitigation system will only become more effective
- The success of this project would not be possible without the collaborative support of the South Bay Salt Pond Restoration Project.

Thank you

info@OneShoreline.org

OneShoreline
Building Solutions for a Changing Climate

Science Updates
Donna Ball, Lead Scientist



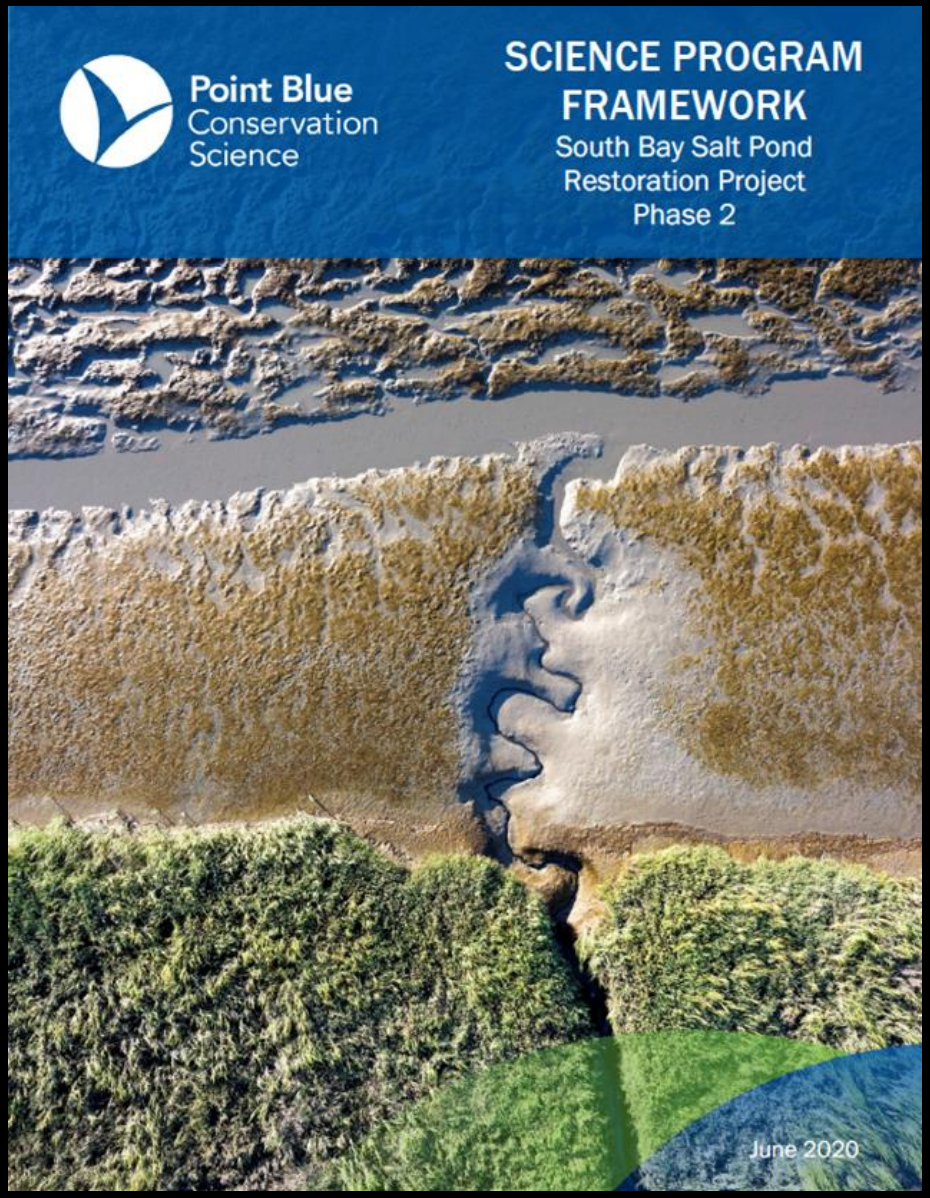



Phase 2 Science Goals

- Expand on Phase 1 Science
- Climate and Science Syntheses → Framework → Plan
- Science studies per AMP
- Regional Science Collaboration
- Science Outreach
  - Website
  - 2022 Science Symposium

Science Framework Priorities

- Snowy Plovers
- Breeding Waterbirds
- Sediment
- Mercury/Water Quality



Western Snowy Plover

Goals

- **Maintain diversity and abundance**
- **Contribute to recovery goal**
- **Predation**
- **Habitat enhancements**
- **Regional habitat availability**

Snowy Plover


Ben Pearl, SFBBO

Status

Monitoring/Studies

- Breeding Surveys
- Banding
- Predation Study
- Habitat enhancements

Waterbirds

Goal:

- **Maintain number of migratory and nesting waterbirds.**
- **Predation**

Monitoring/Studies

- **Breeding Waterbirds**
  Surveys 2022 and 2024
- **Pond Surveys**
  Fall, Winter, Spring Surveys
- **Phalaropes**
  SF Bay and Range-wide study
- **Motus Towers**

Avocets, Stilts, and Forster's Terns

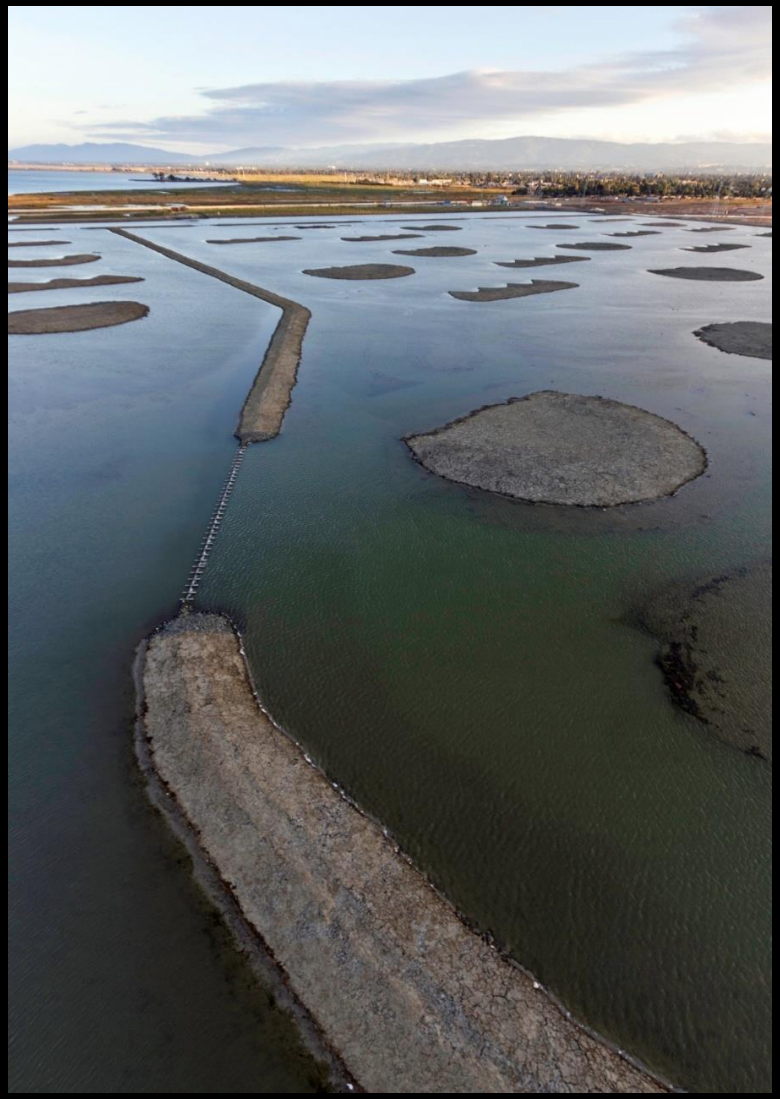
2022 Survey Results

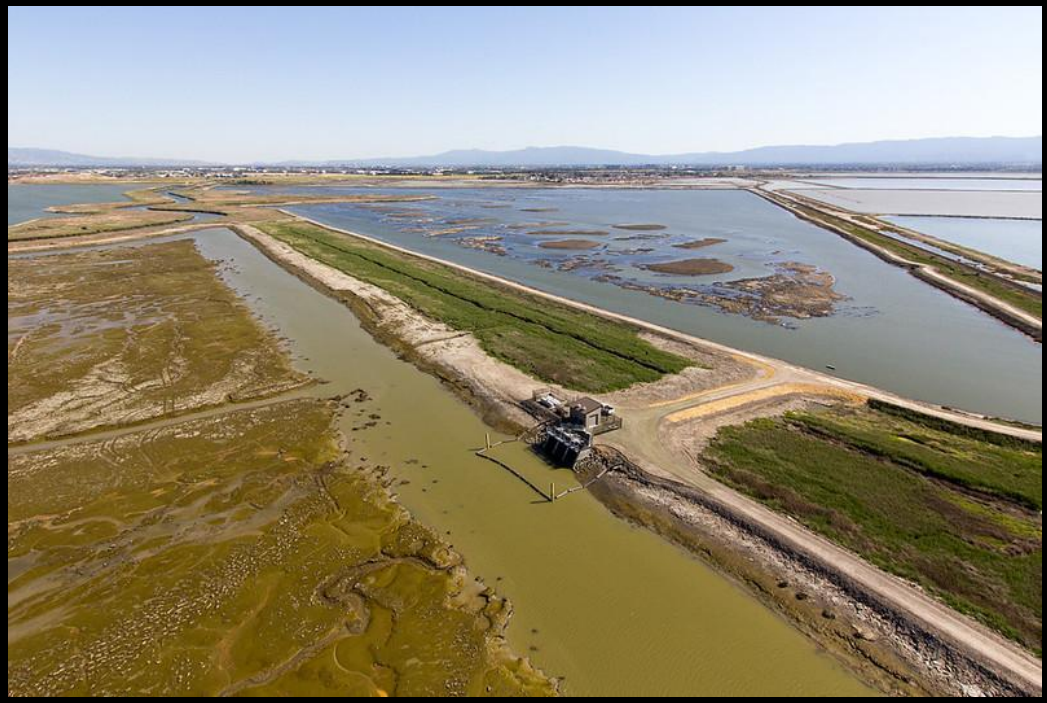
AMAV Nests - 176
(30% nest success)
18-yr low

BNST nests - 97
(29% nest success)
18-yr low

FOTE nests - 1,727
53% nest success)
18-yr high

Avocets, Stilts, and Forster's Terns





86% FOTE Nests!!!

Phalaropes

Goal

- Maintain numbers and breeding success

Monitoring/Studies

- Migratory Pond Surveys (SFBBO)
- Timing surveys
- Study Historical trends

*Species using less saline ponds than expected.

Photos: Ken Phenicie

Sediment

Goals

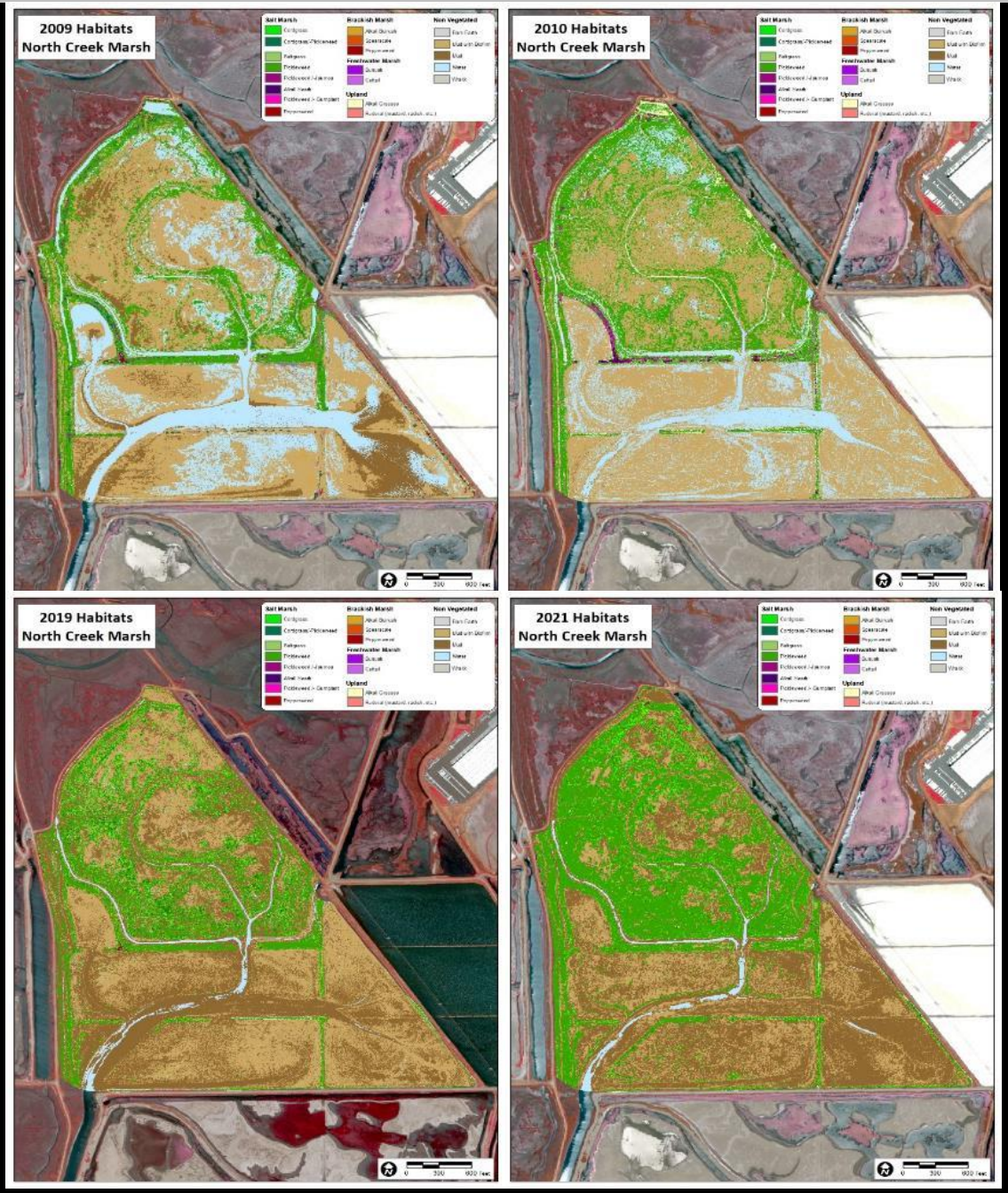
- Accretion to support tidal marsh habitat establishment
- No decrease in intertidal and subtidal habitats
- No loss of vegetated tidal marsh

Monitoring/Studies

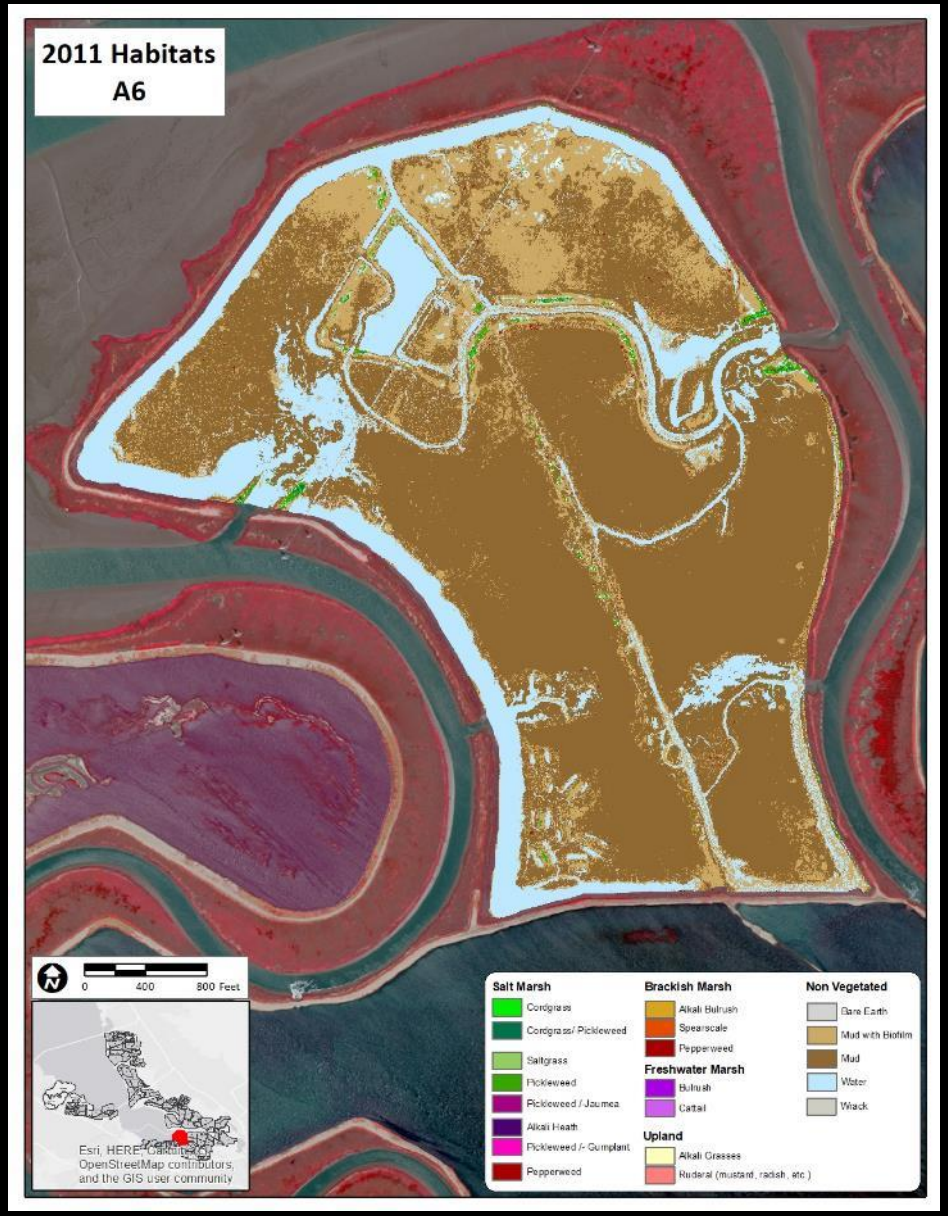
- HEMP (2012 – 2022)
- Accretion rate study - Karen Thorne (USGS/USFWS)
- Lower South Bay Suspended Sediment and Wave Monitoring

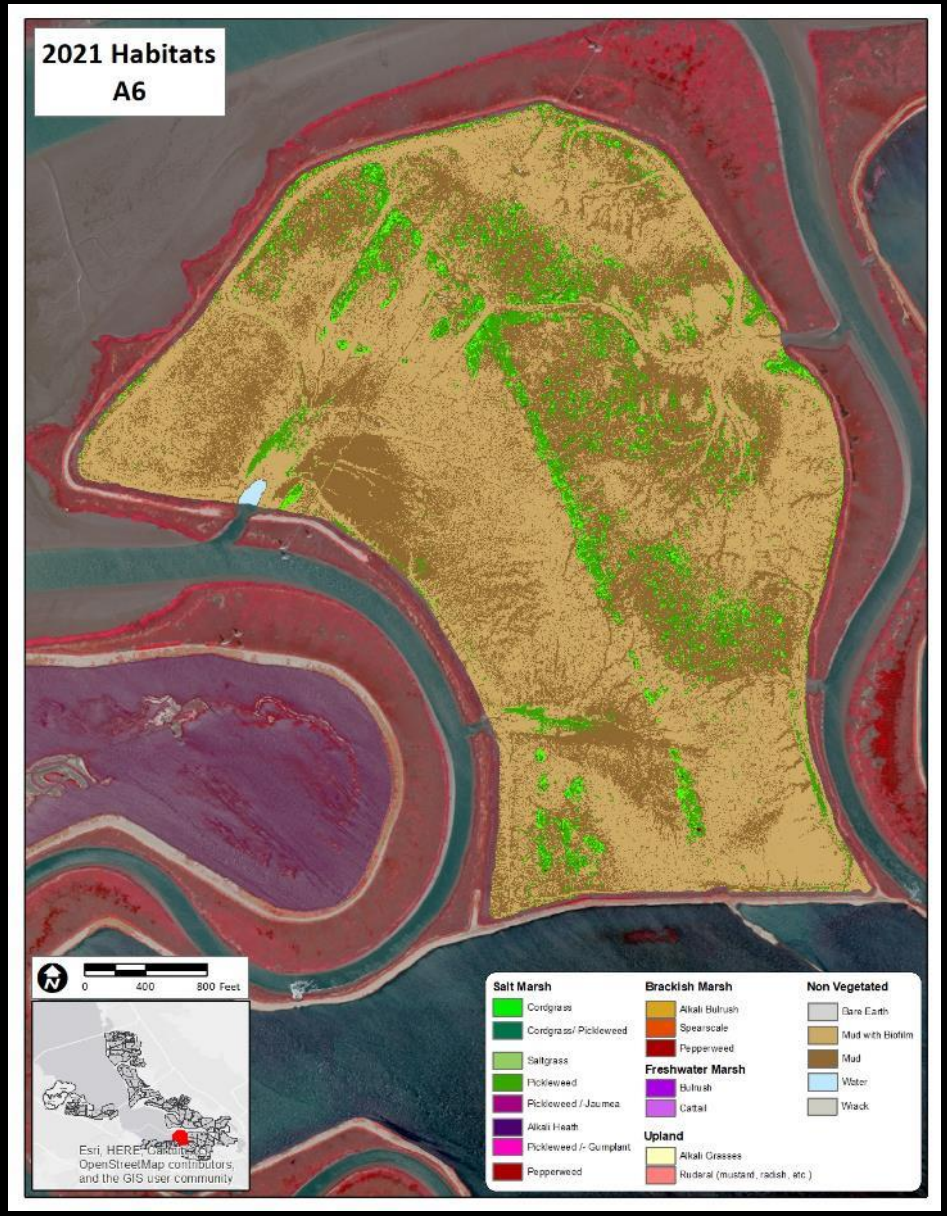
Habitat Evolution Mapping Project 2.0 – Final Results (North Creek Marsh)

HEMP (Brian Fulfrost & Associates)

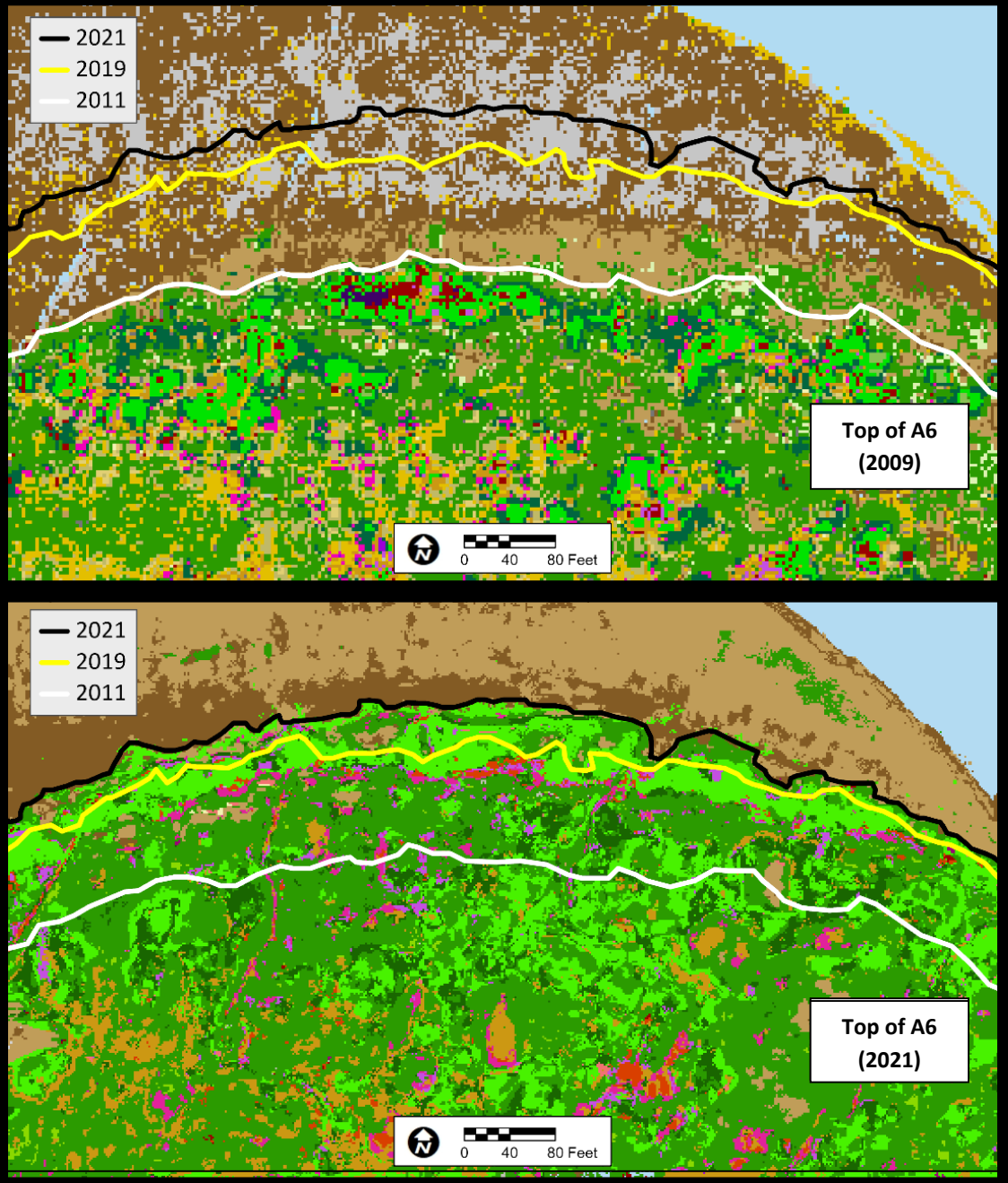


Habitat Evolution Mapping Project 2.0 – Final Results (A6)

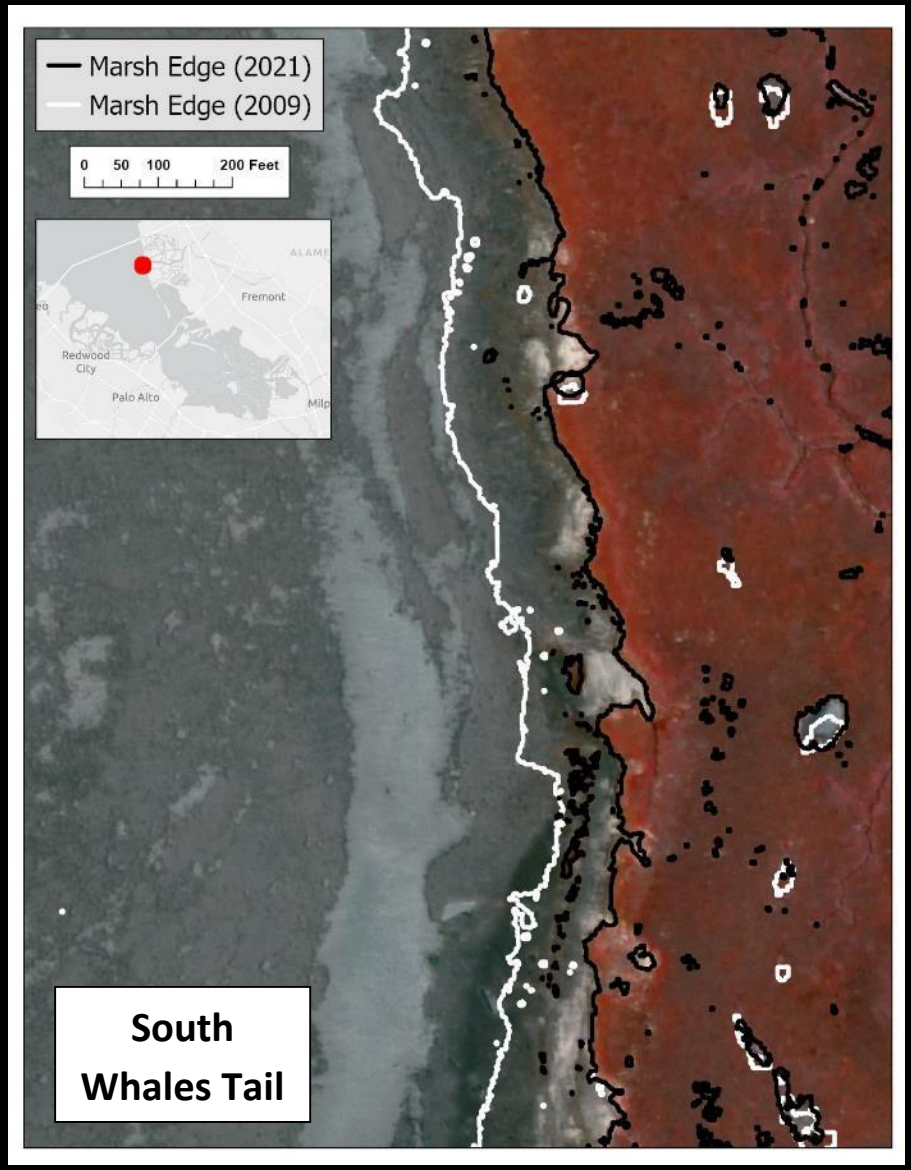


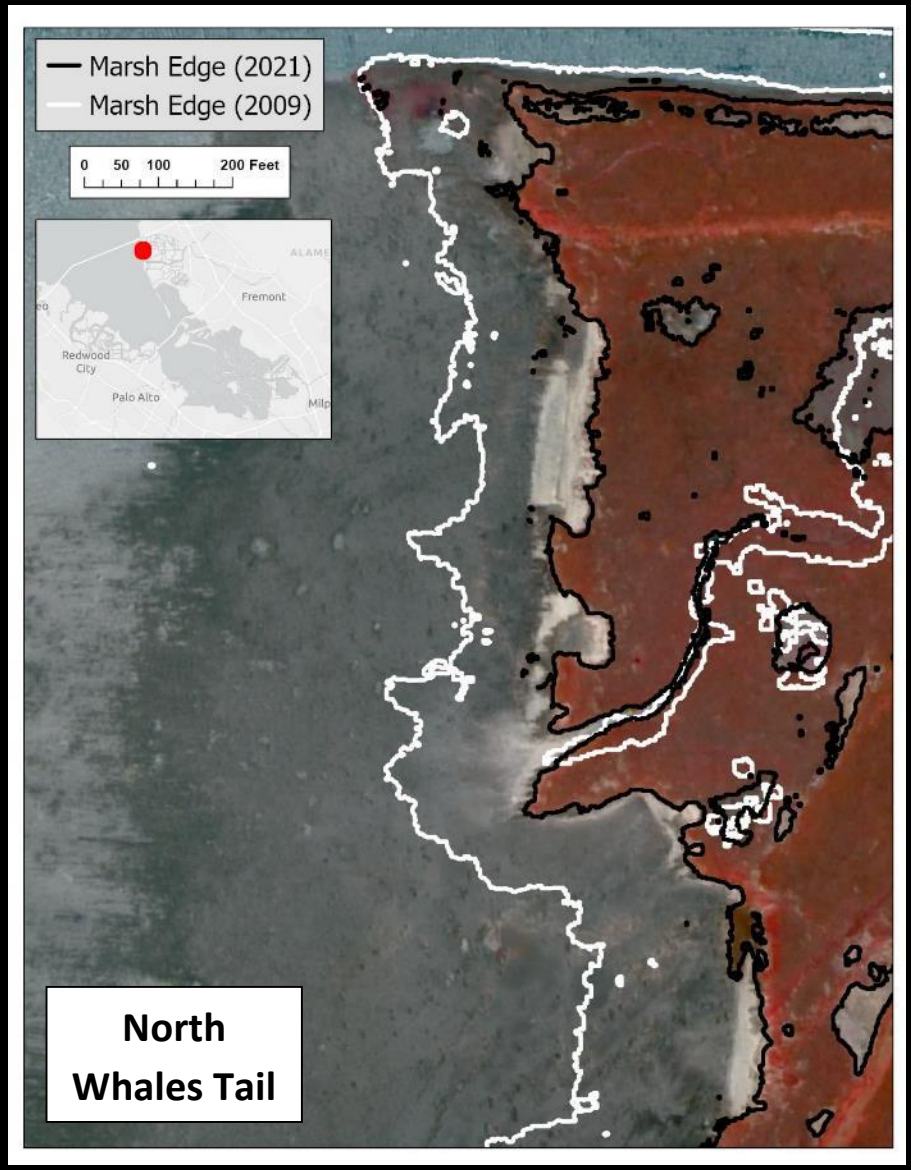


Habitat Evolution Mapping Project 2.0 – Final Results (Top of A6)



Habitat Evolution Mapping Project 2.0 – Marsh Erosion: 2009-2021 (Whales Tail)





USGS Accretion Rate Study

- 24 Cores
- 8 Marshes
- Cs-137 and Pb-210
- Accretion rates
- Soil properties
- WARMER-2


USGS
SGS
changing world
0
1.25
2.5
5
7.5
10
Kilometers
Core Locations
Don Edwards NWR
Marsh Parcels

Mercury and Water Quality

South San Francisco Bay Salt Pond Restoration Project
- A Synthesis of Phase-1 Mercury Studies

Marvin-DiPasquale, M., Slotton, D., Ackerman, J.T., Downing-Kunz, M., Jaffe, B.E., Foxgrover, A.C., Achete, F., and van der Wegen, M., 2022, South San Francisco Bay Salt Pond Restoration Project—A synthesis of Phase-1 mercury studies, U.S. Geological Survey Scientific Investigations Report 2022-5113, 147 p., https://doi.org/10.3133/sir202251

Water Quality

Limit adverse effects

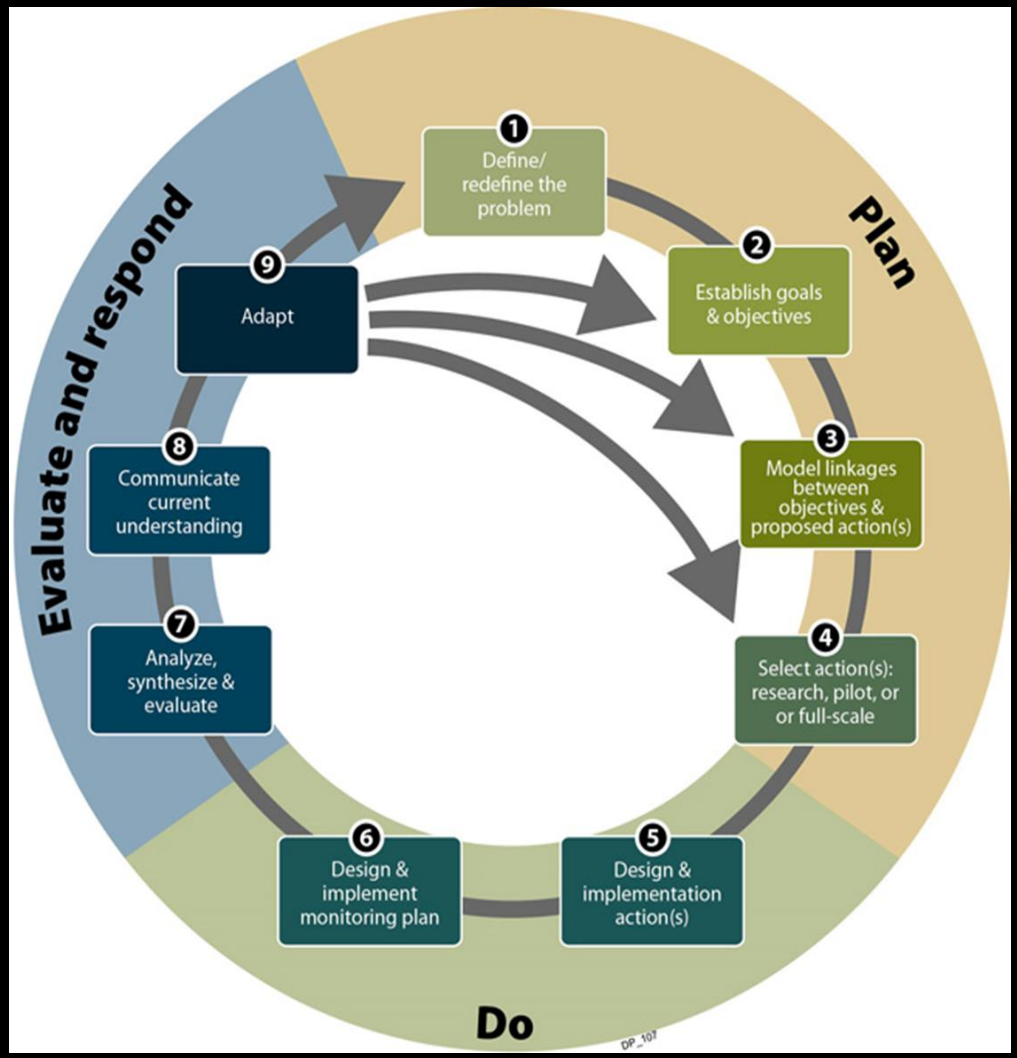
- **Restoration**
- **Pond management**
- **Pond water effects on sloughs**

Jerrod Sellers (USFWS) WQ Sampling at Pond SF2

Monitoring Studies:

- Ongoing O&M Water Quality
- Fish and Water Quality monitoring at Ravenswood
- Water quality effects on sloughs (NMS)

Adaptive Management Plan




REFRESH

CATEGORY/ PO	RESTORATION TARGET	MONITORING PARAMETER (METHOD)	SPATIAL SCALE FOR MONITORING RESULTS	EXPEC D
Sediment Dynamics Project Objective 1 (Preserve existing estuarine habitat areas)	No significant decrease in South Bay intertidal and subtidal habitats (south of San Bruno shoal), including restored pond mudflat, intertidal mudflat, subtidal shallow and subtidal channel areas.	▪ Area of restored mudflat. ▪ Area of outboard mudflat. ▪ Area of subtidal shallows and channel. Methods: Bathymetry and LiDAR surveys will be performed periodically, initially every 3–5 years and then less frequently if data suggest slower rates of	▪ Change in tidal mudflat and subtidal shallows expected to vary at the pond complex scales. Areas will be estimated and reported on the pond complex scale. ▪ Changes in South Bay need to be placed within system-wide (San Francisco Estuary) context to assess influence of external factors.	▪ Chang subtid years, tidal h contin ▪ Subtid 5 year

EXPECTED TIME FRAME FOR DECISION-MAKING	MANAGEMENT TRIGGER	APPLIED STUDIES	POTENTIAL MANAGEMENT A
▪ Change in tidal mudflat & subtidal shallow: 10–20 years, assuming significant tidal habitat restoration continues beyond Phase 1. ▪ Subtidal channel change: 0–5 years.	▪ Outboard mudflat decreases greater than the range of natural variability + observational variability/error.	▪ Will sediment movement into restored tidal areas significantly reduce habitat area and/or ecological functioning (such as plankton, benthic, fish or bird diversity or abundance) in the South Bay? ▪ Development of a 2- and 3-D South Bay tidal habitats evolution model.	▪ Convene study session to and interpret findings to a observed changes are due restoration actions or syst wide changes in the sedim budget (*e.g.*, effects of sea rise). ▪ Study biological effects o mudflat, subtidal shallows subtidal channel habitat. ▪ Adjust restoration phasing design to reduce net loss o mudflats. Potential action include remove bayfront l increase wind fetch and su tidal mudflat, phase breac match demand and supply

Process and Products

- Line by Line review (Science Team and PMT)
- Suggested changes/recommendations
- Management
  - Focus on items that we need to manage and acquire funding for

Questions?

Funding

Unprecedented levels of funding for programs that can support habitat restoration

State Coastal Conservancy	**$100-$200** million over several years for SF Bay
U.S. Environmental Protection Agency	**$30 million** in 2023 for S.F. Bay Water Quality Improvement Fund
San Francisco Bay Restoration Authority	**$25 million** annually for 20 years
National Oceanic and Atmospheric Administration	**$207 million** over several years for habitat restoration (nationwide)
National Oceanic and Atmospheric Administration	**$492 million** over several years for coastal resilience (nationwide)

Fundraising for Phase 2 Construction

Project Site	Cost Estimate	Funding in Hand	Needed
Mountain View (ponds A1 and A2W)	$15-$18 million	$11.4 million	$3.6-$6.6 million
Southern Eden Landing	$30-$35 million	$16.5 million	$13.5-$18.5 million

Funding* for Phase 2 Science

Fund Source	Amount	Spent / Allocated	Remaining
Coastal Conservancy – General Fund	$1,044,000	$280,000	$764,000
Coastal Conservancy - Proposition 68	$1,000,000	$868,000	$132,000
SFBRA - Measure AA	$1,200,000	$1,200,000	$0

*Doesn't include match funding secured by researchers/grantees

Wrap-Up

- Complete Phase 2 at Refuge
- Initiate construction at Eden Landing
- Implement priority Science Program items
- Advance partner projects
- Extend partnerships for regional monitoring
- YOU can get involved!
- Stick around for more Q&A

Dave Halsing
California Coastal Conservancy
dave.halsing@scc.ca.gov or 650-814-0588

Ann Spainhower
Don Edwards San Francisco Bay National Wildlife Refuge
ann_spainhower@fws.gov or 341-216-8181

Carly White
California Department of Fish and Wildlife
carly.white@wildlife.ca.gov or 707-815-8630

Laura Cholodenko
California State Coastal Conservancy
laura.cholodenko@scc.ca.gov or 510-286-0752

Donna Ball
Lead Scientist, San Francisco Estuary Institute
donnab@sfei.org or 360-460-5227

Thank You
For your Interest & Participation!

Courtesy of Invasive Spartina Project

www.southbayrestoration.org

Follow us on Facebook