



# **South Bay Salt Pond Restoration Project**

## **Final Environmental Impact Statement / Report**

### **Executive Summary**

**December 2007**



**Submitted to:  
U. S. Fish and Wildlife Service  
California Department of Fish and Game**

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## EXECUTIVE SUMMARY

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### S.1 Introduction

This Final Environmental Impact Statement/Environmental Impact Report (EIS/R) was prepared by the US Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) partnering with the California Coastal Conservancy (Conservancy), US Army Corps of Engineers (Corps), Santa Clara Valley Water District (SCVWD), and Alameda County Flood Control and Water Conservation District (ACFCWCD) to evaluate the potential environmental impacts of the proposed South Bay Salt Pond (SBSP) Restoration Project.

This Final EIS/R has been revised in response to the public comments received on the SBSP Restoration Project Draft EIS/R during the public review period. Formal responses to the comments received on the Draft EIS/R are presented in Appendix O of this Final EIS/R. Appendix O also includes a section identifying minor revisions (corrections and clarifications) made by the lead agencies.

Many of the comments received during the public review period addressed the following issues:

- Relationship between the SBSP Restoration Project and the South San Francisco Bay Shoreline Study;
- Scope of the EIS/R;
- Preferred alternative;
- Adaptive Management Plan funding;
- Aircraft bird strikes;
- Public access and impacts to wildlife;
- Wildlife impact significance thresholds;
- Flooding;
- Impacts of sea level rise;
- Hunting; and
- Invasive *Spartina* and other invasive species.

Please refer to Appendix O, Response to Comments, for responses to comments on these issues and all of the comments on the Draft EIS/R.

#### S.1.1 SBSP Restoration Project

The SBSP Restoration Project (Project) encompasses approximately 15,100 acres of former salt ponds located around the edge of South San Francisco Bay, and, if approved, would be the largest wetlands restoration project on the West Coast of the United States. The Project is intended to restore and enhance wetlands in South San Francisco Bay while providing for flood management and wildlife-oriented public access and recreation. The six Project Objectives are presented in the box below.

Prior to the arrival of Europeans in the Bay Area, the Project Area consisted of tidal marsh and associated habitats, as did much of the land fringing the Bay. Over time, however, 80 to 90 percent of this tidal marsh was lost to development. In the case of the Project Area, it was converted to use as commercial salt production facilities through diking and impounding of Bay waters.

In 2003, Cargill Inc. (Cargill), the owner of the salt ponds in the Project Area, sold the ponds to USFWS and CDFG, with USFWS acquiring 9,600 acres at the western end of Dumbarton Bridge (the Ravenswood pond complex) and along the Bay from Mountain View to Fremont (the Alviso pond complex), and CDFG acquiring the remaining 5,500 acres just south of the eastern end of the San Mateo Bridge (the Eden Landing pond complex) (Figure ES-1). The agencies prepared an Environmental Impact Report/Environmental Impact Statement for the Initial Stewardship Plan (ISP) for the ponds, which included the construction of water control structures that would allow the former salt ponds to be reconnected to the Bay and to preserve their current value as habitat while a long-term restoration plan was developed for the Project. The ISP also included the restoration of an initial 479 acres of ponds in the far southeastern corner of the Bay (Ponds A19, A20, and A21) to full tidal inundation, which occurred in March 2006.

This EIS/R evaluates three long-term alternatives for the Project, each of which represents a progression toward a different long-term end-state. They are:

#### **SBSP Restoration Project Objectives**



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

- Alternative A – No Action is the expected scenario if no long-term restoration plan is implemented. CDFG and USFWS would continue to operate and maintain the ponds in a manner similar to the ISP, although it is assumed that CDFG and USFWS would not have funding to maintain full ISP operations over the 50-year planning horizon. No new public access or recreational facilities are proposed under this alternative. Alternative A at Year 50 is depicted in Figures ES-2a through ES-2c.
- Alternative B – Managed Pond Emphasis (50:50 tidal habitat : managed ponds by area) when fully implemented would provide approximately 7,500 acres of tidal habitat and 7,500 acres of managed pond habitat. Approximately 20 percent of the managed ponds (approximately 1,600 acres) would be reconfigured and intensively managed to improve foraging, roosting, and nesting opportunities for shorebirds, waterfowl, and other waterbirds. In addition, Alternative B would provide a cohesive line of flood protection along the perimeter of the Project Area (landward edge of the former salt ponds). This alternative would also provide public access and



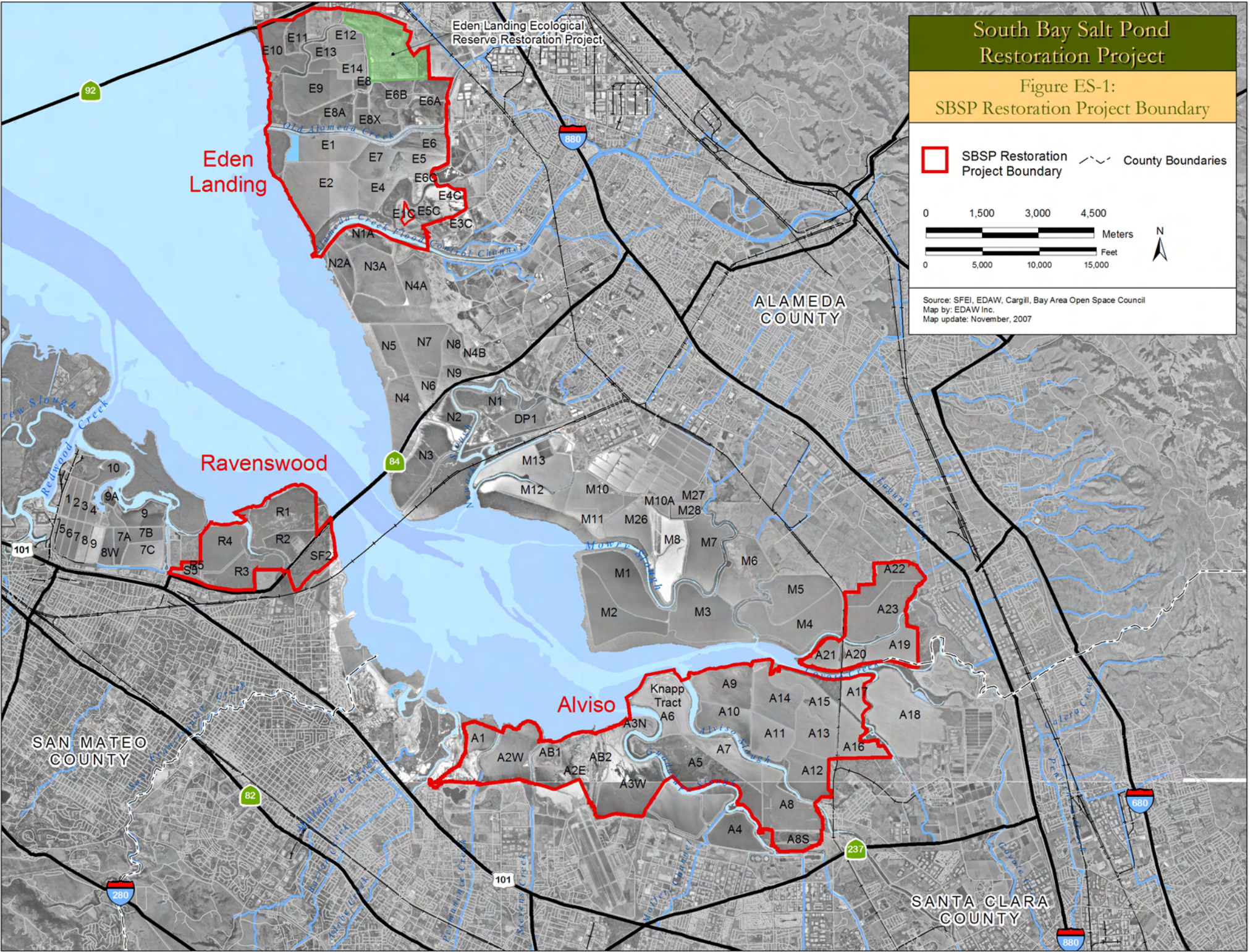
South Bay Salt Pond  
Restoration Project

Figure ES-1:  
SBSP Restoration Project Boundary

 SBSP Restoration Project Boundary      County Boundaries

0 1,500 3,000 4,500  
0 5,000 10,000 15,000     Meters     Feet     N

Source: SFEI, EDAW, Cargill, Bay Area Open Space Council  
Map by: EDAW Inc.  
Map update: November, 2007





recreation features in the form of trails and viewing platforms, interpretive stations, waterfowl hunting, access to and interpretation of cultural resource features, opportunities for education and interpretation, non-motorized boat launching points and associated staging and parking areas. Alternative B at Year 50 is depicted in Figures ES-3a through ES-3c.

- Alternative C – Tidal Emphasis (90:10 tidal habitat : managed ponds by area) when fully implemented would provide approximately 13,400 acres of tidal habitat and 1,600 acres of managed ponds. All the managed ponds in Alternative C would be reconfigured and intensively managed to substantially enhance foraging, roosting, and nesting opportunities for shorebirds, waterfowl, and other waterbirds. Flood protection under Alternative C would be similar to Alternative B, with the exception that more existing slough levees would be abandoned as more ponds are converted to tidal habitat in Alternative C. Alternative C would also provide public access and recreation features similar to those described for Alternative B above. Alternative C at Year 50 is depicted in Figures ES-4a through ES-4c.

Alternatives B and C are “bookends” that represent possible outcomes ranging from a 50:50 tidal to managed pond scenario to a 90:10 tidal to managed pond scenario. The optimal configuration of tidal habitat and managed ponds that achieves the SBSP Restoration Project Objectives while avoiding significant impacts to environmental resources cannot be determined at this time due to a number of uncertainties, but would likely fall somewhere between these “bookends;” this configuration would be guided by the Adaptive Management Plan, the cornerstone of the SBSP Restoration Project. The Adaptive Management Plan is presented in Appendix D of this EIS/R. Section S.4 of this Executive Summary provides more information on the role of adaptive management in the SBSP Restoration Project.

The basic layout of tidal and pond habitats in Alternatives B and C presumes a progressive conversion of ponds to tidal habitats over time. The two alternatives are laid out to represent a continuum: a gradual progression over time from a 50:50 ratio of tidal habitat to managed pond (Alternative B), to a 90:10 ratio (Alternative C) provided that monitoring results confirm that the Project Objectives are being achieved. The implicit assumption in this construct is that ponds that are managed ponds under Alternative B would not be converted to tidal habitat unless and until after:

- The 50:50 mix of tidal and managed pond habitats under Alternative B is achieved, and
- Monitoring and studies have confirmed that further conversion of ponds to tidal habitat is acceptable.

The EIS/R also addresses Phase 1 of the SBSP Restoration Project in greater detail than the program alternatives (see Figure ES-5). The Phase 1 actions are elements common to both long-term Alternatives B and C. Phase 1 actions would include restoration of a range of habitat types and early experiments for adaptive management.

The EIS/R evaluates the long-term alternatives for the Project over a 50-year planning horizon, including consideration of global climate change and relative sea level rise on habitat distributions and flood hazards. Relative sea level rise – or the rate of sea level rise expected to be observed locally – is a product of global sea level rise, tectonic land movements and local subsidence.



The rate of global sea level rise is expected to continue along a global warming-induced trajectory. Although uncertainty exists regarding this rate, ongoing research on global sea level rise continues to narrow the uncertainties and refine future estimates. For the purpose of this EIS/R, the Intergovernmental Panel on Climate Change (IPCC) mid-range estimate of 6 inches of future global sea level rise by 2050, and 18 inches by 2100 was used (IPCC 2001). The higher rates in the second half of the century reflect the effects of accelerated sea level rise. The 2001 IPCC estimate was selected because the EIS/R analyses were prepared between January 2004 and February 2007 when the 2001 rates were the most recent available. In May 2007, the IPCC released an updated report on global climate change including revised sea level rise estimates for the twenty-first century (2000 to 2100) (IPCC 2007). The 2007 IPCC estimates are slightly lower than the 2001 estimates with a narrower band of uncertainty (IPCC 2007). It is important to note that the IPCC projections do not include the contribution of large-scale changes in ice sheet melting (referred to as ice sheet mass wasting) to sea level rise due to difficulties in predicting these contributions. Other recent studies (*e.g.*, Rahmstorf 2007) provide higher estimates of future sea level rise. Tectonic land movements and local subsidence also affect relative rates of sea level rise and are described in more detail in Section 3.3 of this EIS/R.

The consequences of accelerated sea level rise on habitat evolution were evaluated for the SBSP Restoration Project (South Bay Geomorphic Assessment, Appendix I). The South Bay, and in particular the far South Bay, have historically been sediment-laden depositional environments (Jaffe and others 2006a, Jaffe and others 2006b). Watson (2004) showed that over the second half of the last century the far South Bay sustained marshes at a time when relative sea level rise (caused by rapid subsidence) was very high. Looking forward, if sea level rise matches the mid-range of the IPCC (2001) predictions and sediment availability to the South Bay remains the same, sustainable vegetated tidal marshes are expected to develop in the tidally-restored ponds within the Project's 50-year planning horizon. If higher rates of sea level rise prevail, tidally-restored areas within the SBSP Restoration Project Area may persist as intertidal unvegetated mudflats or shallow open water habitat for prolonged periods. The tidally-restored ponds would still be expected to accrete sediment and eventually support vegetated tidal marsh, except at a slower rate (South Bay Geomorphic Assessment, Appendix I).

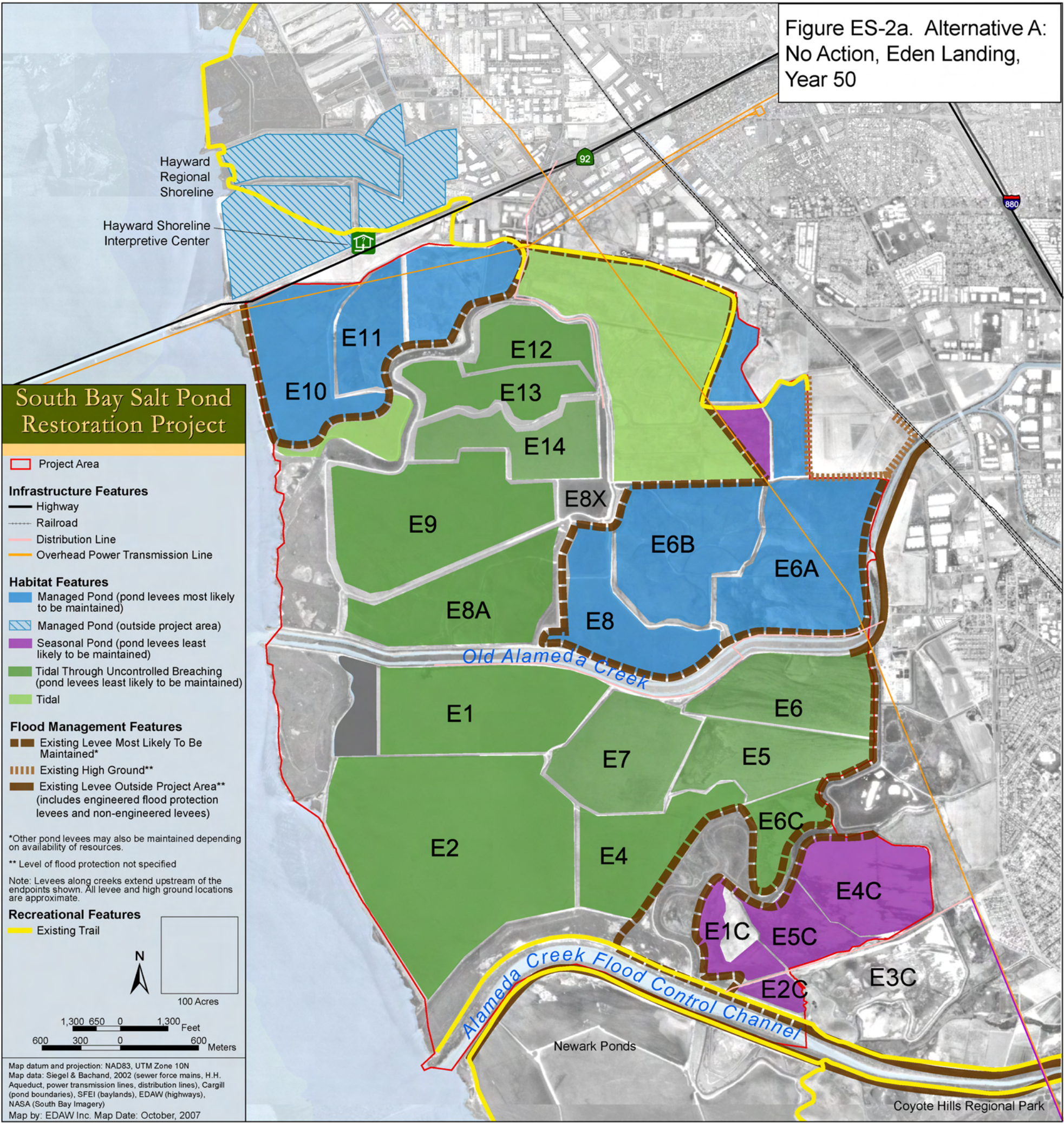
Although the Project bookends (50:50 and 90:10) would not change, higher than anticipated sea level rise rates that result in delayed or arrested marsh establishment could hinder the progression towards Alternative C, resulting in a landscape somewhere between Alternative B and C. Sea level rise represents only one of many uncertainties that could affect the ultimate habitat mix. As future phases of the Project enter the project-level design and analysis stage, the best available sea level rise estimates would be used. A number of features can be built into the future designs to accommodate accelerated sea level rise, such as constructing a gradually sloping marsh/upland transition zone surface that provides an elevation gradient over which tidal marsh could shift upslope as sea level rises, and initiating marsh vegetation plantings to maximize sediment-trapping efficiencies and enhance the accumulation of organic matter in the developing marsh sediments. Managed pond operations and pond levee maintenance would be adjusted over time with sea level rise. Flood protection levees would be designed to accommodate future sea level rise, either with higher crest elevations at the time of initial construction or with the flexibility to add levee height in the future. Ongoing levee maintenance would maintain levee crest elevations as needed to provide continued flood protection with sea level rise.



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Figure ES-2a. Alternative A: No Action, Eden Landing, Year 50





# South Bay Salt Pond Restoration Project

Figure ES-2b. Alternative A:  
No Action, Alviso, Year 50

**Project Area**

**Infrastructure Features**

- Highway
- Railroad
- Distribution Line
- Overhead Power Transmission Line

**Habitat Features**

- Managed Pond (pond levees most likely to be maintained)
- Managed Pond (outside project area)
- Seasonal Pond (pond levees most likely to be maintained)
- Tidal Through Uncontrolled Breaching (pond levees least likely to be maintained)
- Tidal

**Flood Management Features**

- Existing Levee Most Likely To Be Maintained\*
- Existing High Ground\*\*
- Existing Levee Outside Project Area\*\* (includes engineered flood protection levees and non-engineered levees)

\*Other pond levees may also be maintained depending on availability of resources.

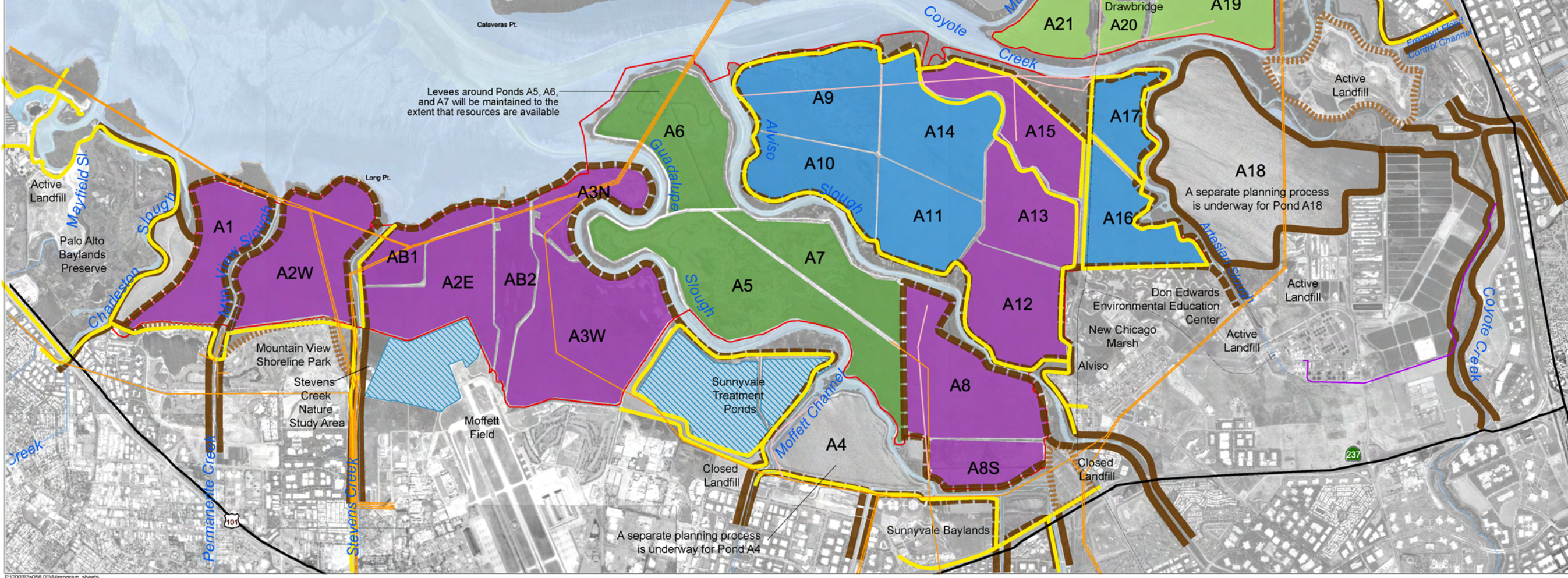
\*\* Level of flood protection not specified

Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

**Recreational Features**

- Existing Trail

Map datum and projection: NAD83, UTM Zone 10N  
 Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (project boundary & baylands), EDAW (highways), NASA (South Bay Imagery)  
 Map by: EDAW Inc. Map date: November, 2007





# South Bay Salt Pond Restoration Project

Figure ES-2c. Alternative A: No Action, Ravenswood, Year 50

**Project Area**

**Infrastructure Features**

- Highway
- Railroad
- Overhead Power Transmission Line
- Distribution Line

**Habitat Features**

- Managed Pond (pond levees most likely to be maintained)
- Seasonal Pond (pond levees most likely to be maintained)

**Flood Management Features**

- Existing Pond Levee Most Likely To Be Maintained\*
- Existing High Ground\*\*
- Existing Levee Outside Project Area\*\* (includes engineered flood protection levees and non-engineered levees)

\*Other pond levees may also be maintained depending on availability of resources.

\*\* Level of flood protection not specified

Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

**Recreational Features**

- Existing Trail

Map datum and projection: NAD83, UTM Zone 10N  
 Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (baylands), EDAW (highways), NASA (South Bay Imagery), Project Boundary taken from SFEI Interactive Map  
 Map by: EDAW Inc. Map date: October, 2007

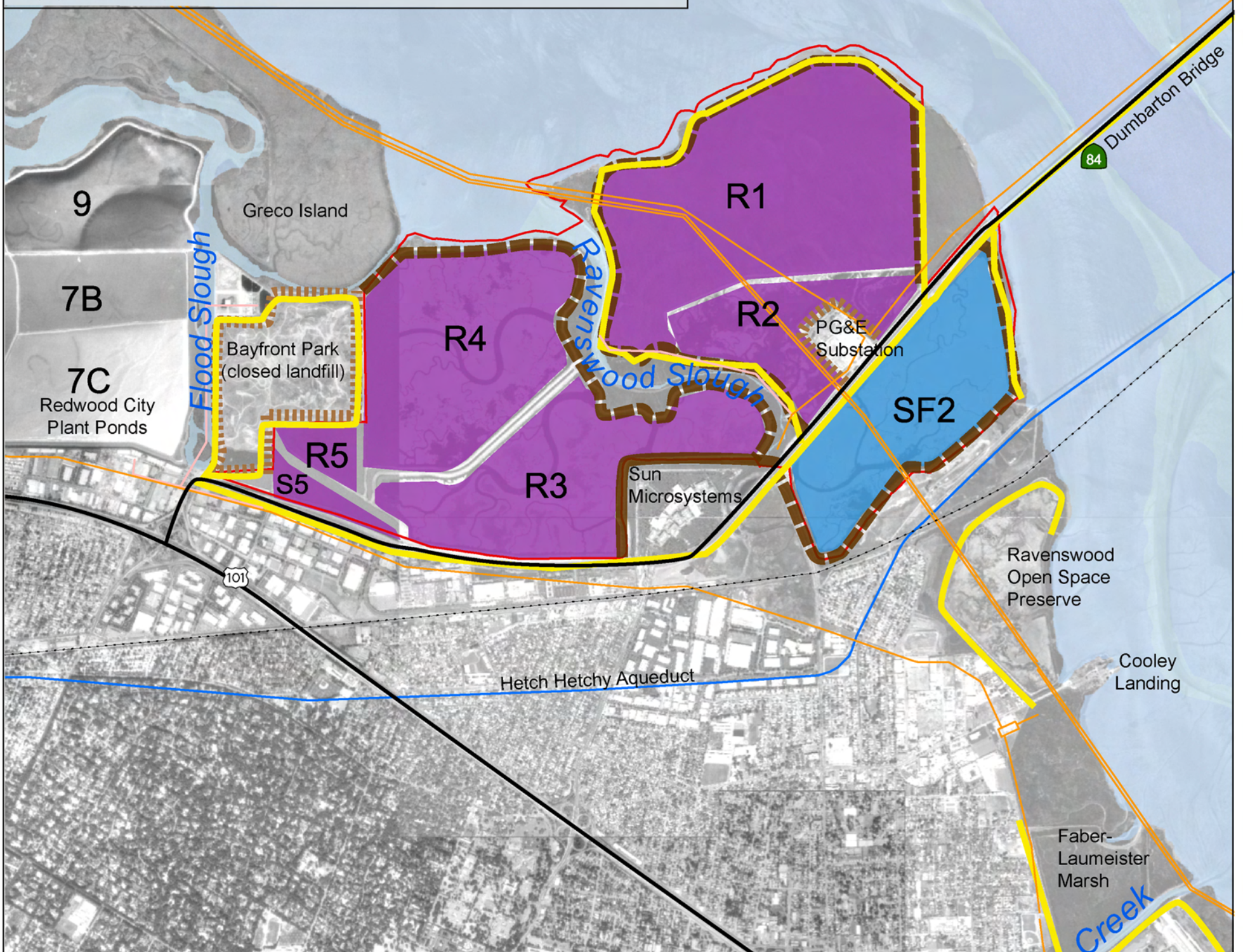
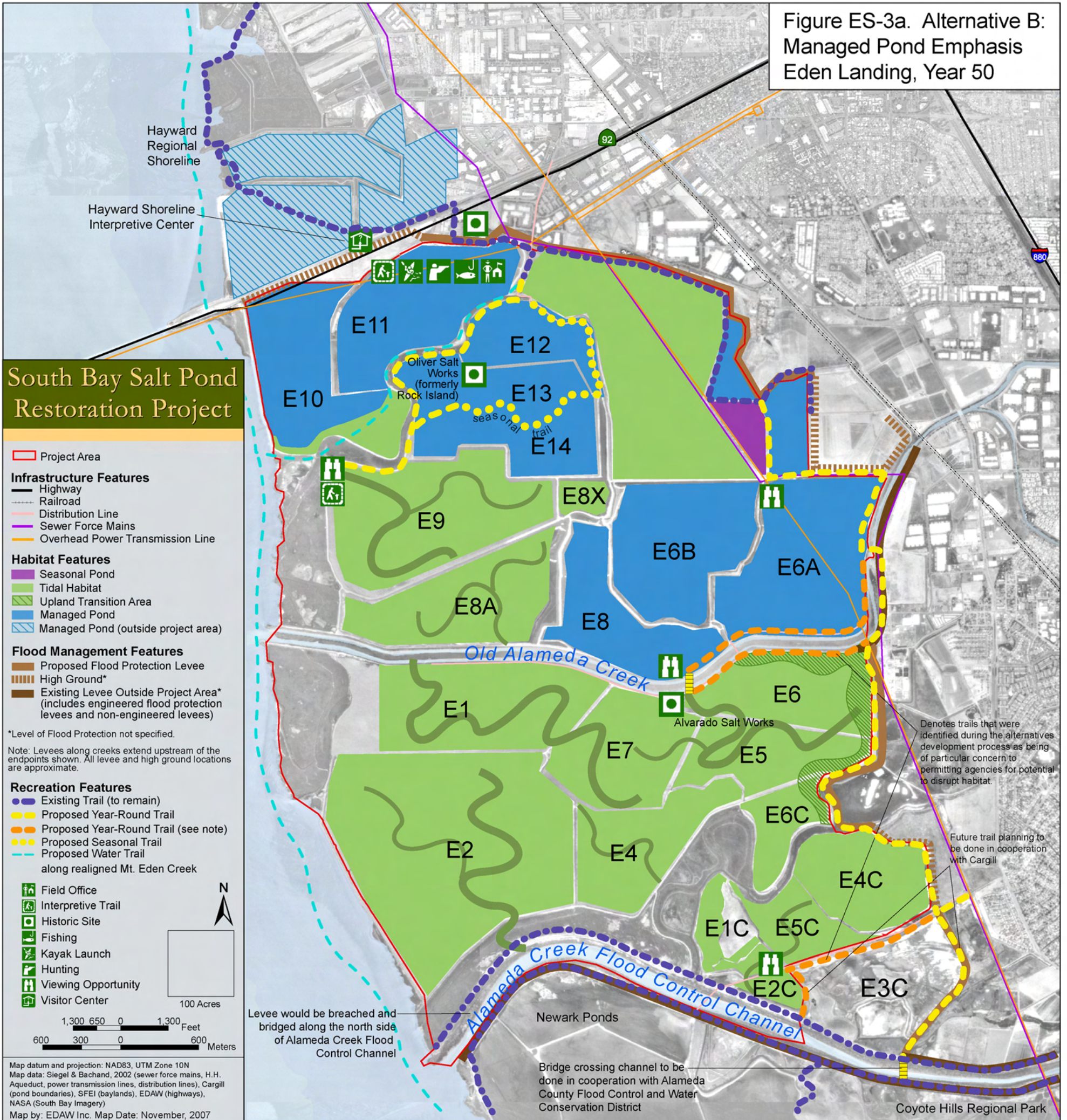




Figure ES-3a. Alternative B: Managed Pond Emphasis Eden Landing, Year 50





# South Bay Salt Pond Restoration Project

Figure ES-3b. Alternative B:  
Managed Pond Emphasis  
Alviso Year 50

**Project Area**

**Infrastructure Features**

- Highway
- Railroad
- Wastewater Outfall
- PG & E Access Points
- Hetch Hetchy Aqueduct
- Overhead Power Transmission Line
- Sewer Force Main
- Distribution Line

**Habitat Features**

- Tidal Habitat
- Upland Transition Area
- Managed Pond
- Managed Pond (outside project area)
- Initially Reversibly Tidal; Ultimately Tidal

**Flood Management Features**

- Proposed Flood Protection Levee
- High Ground\*
- Existing Levee Outside Project Area\* (includes engineered flood protection levees and non-engineered levees)

\*Level of flood protection not specified.  
Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

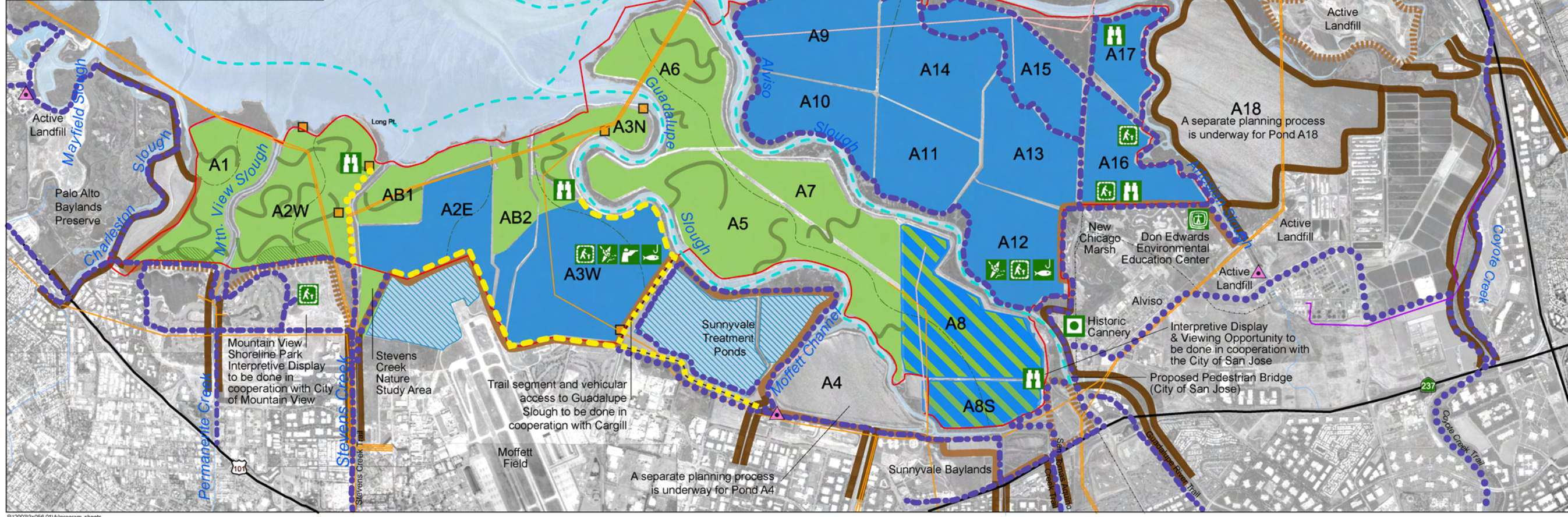
**Recreational Features**

- Interpretive Trail
- Historic Site
- Fishing
- Kayak Launch
- Hunting
- Viewing Opportunity
- Environmental Education Center
- Existing Trail (to remain)
- Proposed Year-Round Trail
- Proposed Year-Round Trail (see note)
- Proposed Seasonal Trail
- Proposed Water Trail
- Proposed Vehicular Access
- Proposed Trail (outside project area by others)

3,000 1,500 0 3,000 Feet  
900 450 0 900 Meters

100 Acres

Map datum and projection: NAD83, UTM Zone 10N  
Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (baylands), EDAW (highways), NASA (South Bay Imagery)  
Map by: EDAW Inc. Map date: November, 2007





# South Bay Salt Pond Restoration Project

Figure ES-3c. Alternative B: Managed Pond Emphasis Ravenswood, Year 50

**Project Area**

**Infrastructure Features**

- Highway
- Railroad
- Overhead Power Transmission Line
- Sewer Force Mains
- Distribution Line

**Recreational Features**

- Existing Trail (to remain)
- Existing Trail (to be removed)
- Proposed Year-Round Trail
- Proposed Year-Round Trail (see note)
- Proposed Trail (outside project area by others)
- Proposed Water Trail

**Habitat Features**

- Tidal Habitat
- Upland Transition Area
- Managed Pond
- Tidal Habitat (outside project area)

**Flood Management Features**

- Proposed Flood Protection Levee
- High Ground\*
- Existing Levee Outside Project Area\* (includes engineered flood protection levees and non-engineered levees)

\*Level of flood protection not specified.

Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

Legend for Recreational Features:

- Historic Site
- Kayak Launch
- Viewing Opportunity
- Interpretive Trail

Scale: 100 Acres, 1,300 Feet, 600 Meters

Map datum and projection: NAD83, UTM Zone 10N  
 Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (baylands), EDAW (highways), NASA (South Bay Imagery), Project Boundary taken from SFEI Interactive Map  
 Map by: EDAW Inc. Map date: November, 2007

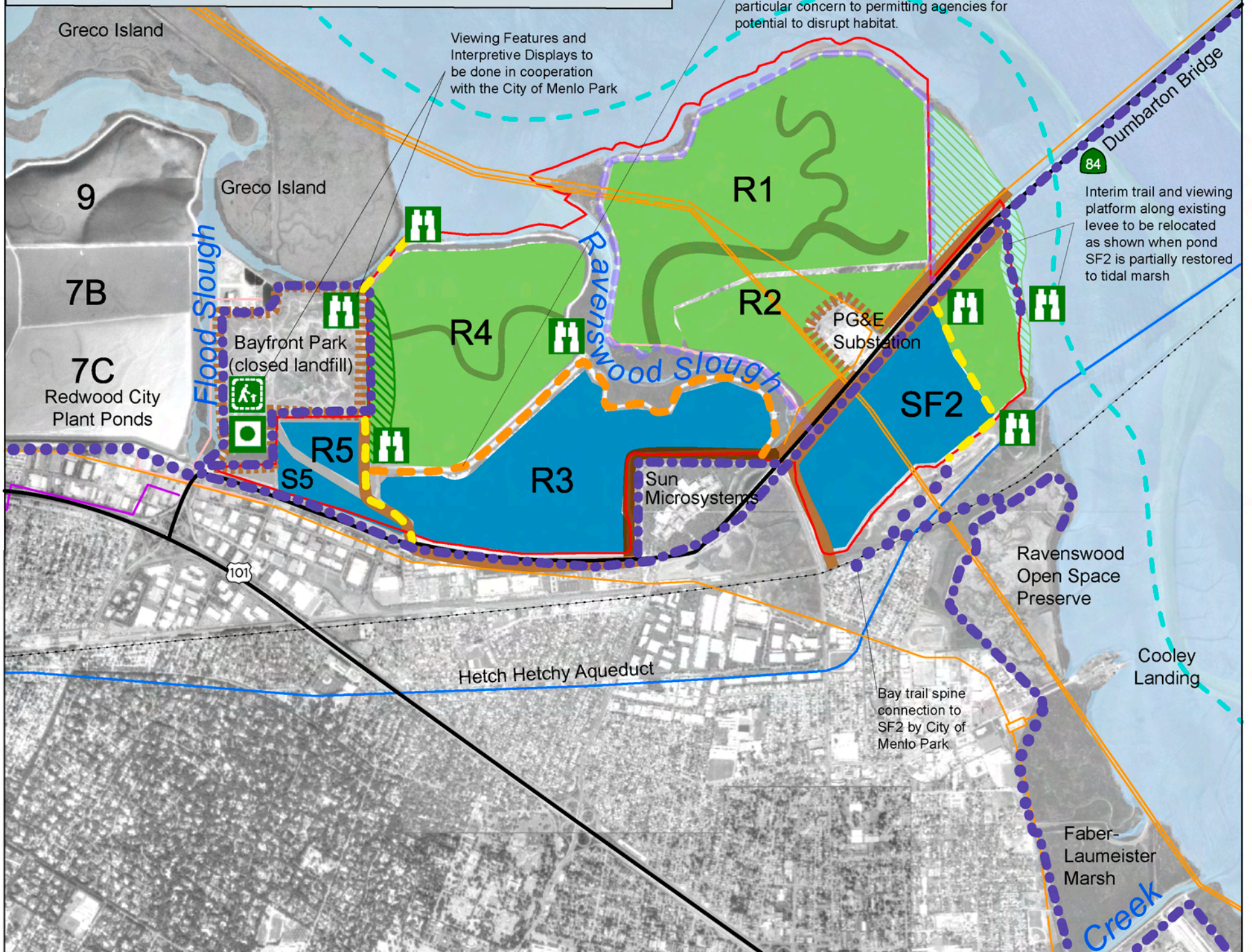




Figure ES-4a. Alternative C:  
Tidal Habitat Emphasis  
Eden Landing, Year 50





# South Bay Salt Pond Restoration Project

Figure ES-4b. Alternative C:  
Tidal Habitat Emphasis  
Alviso Year 50

**Project Area**

**Infrastructure Features**

- Highway
- Railroad
- Wastewater Outfall
- PG & E Access Points
- Hetch Hetchy Aqueduct
- Overhead Power Transmission Line
- Sewer Force Main
- Distribution Line

**Habitat Features**

- Tidal Habitat
- Upland Transition Area
- Managed Pond
- Managed Pond (outside project area)
- Initially Reversibly Tidal; Ultimately Tidal

**Flood Management Features**

- Proposed Flood Protection Levee
- High Ground\*
- Existing Levee Outside Project Area\* (includes engineered flood protection levees and non-engineered levees)

\*Level of flood protection not specified.

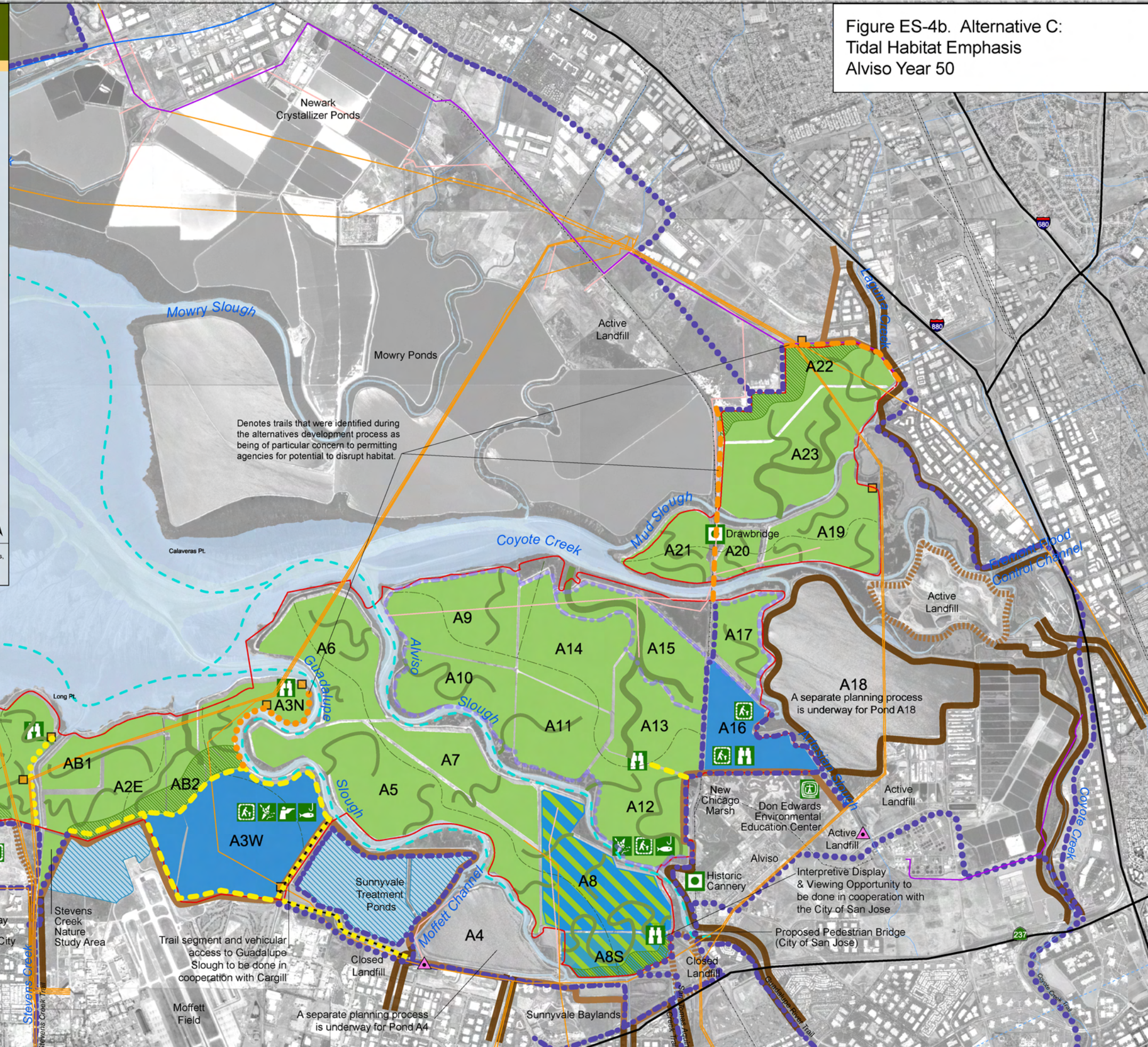
Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

**Recreational Features**

- Interpretive Trail
- Historic Site
- Fishing
- Kayak Launch
- Hunting
- Viewing Opportunity
- Environmental Education Center
- Existing Trail (to remain)
- Existing Trail (to be removed)
- Proposed Year-Round Trail
- Proposed Year-Round Trail (see note)
- Proposed Seasonal Trail
- Proposed Seasonal Trail (see note)
- Proposed Water Trail
- Proposed Vehicular Access
- Proposed Trail (outside project area by others)

Scale: 100 Acres

Map datum and projection: NAD83, UTM Zone 10N  
 Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (baylands), EDAW (highways), NASA (South Bay Imagery)  
 Map by: EDAW Inc. Map date: November, 2007





# South Bay Salt Pond Restoration Project

Figure ES-4c. Alternative C: Tidal Habitat Emphasis Ravenswood, Year 50

Project Area	<b>Habitat Features</b>
<b>Infrastructure Features</b>	Tidal Habitat
Highway	Upland Transition Area
Railroad	Managed Pond
Overhead Power Transmission Line	Tidal Habitat (outside project area)
Sewer Force Mains	<b>Flood Management Features</b>
Distribution Line	Proposed Flood Protection Levee
<b>Recreational Features</b>	High Ground*
Existing Trail (to remain)	Existing Levee Outside Project Area* (includes engineered flood protection levees and non-engineered levees)
Existing Trail (to be removed)	
Proposed Year-Round Trail	
Proposed Year-Round Trail (see note)	
Proposed Trail (outside project area by others)	
Proposed Water Trail	
Historic Site	
Kayak Launch	
Viewing Opportunity	
Interpretive Trail	

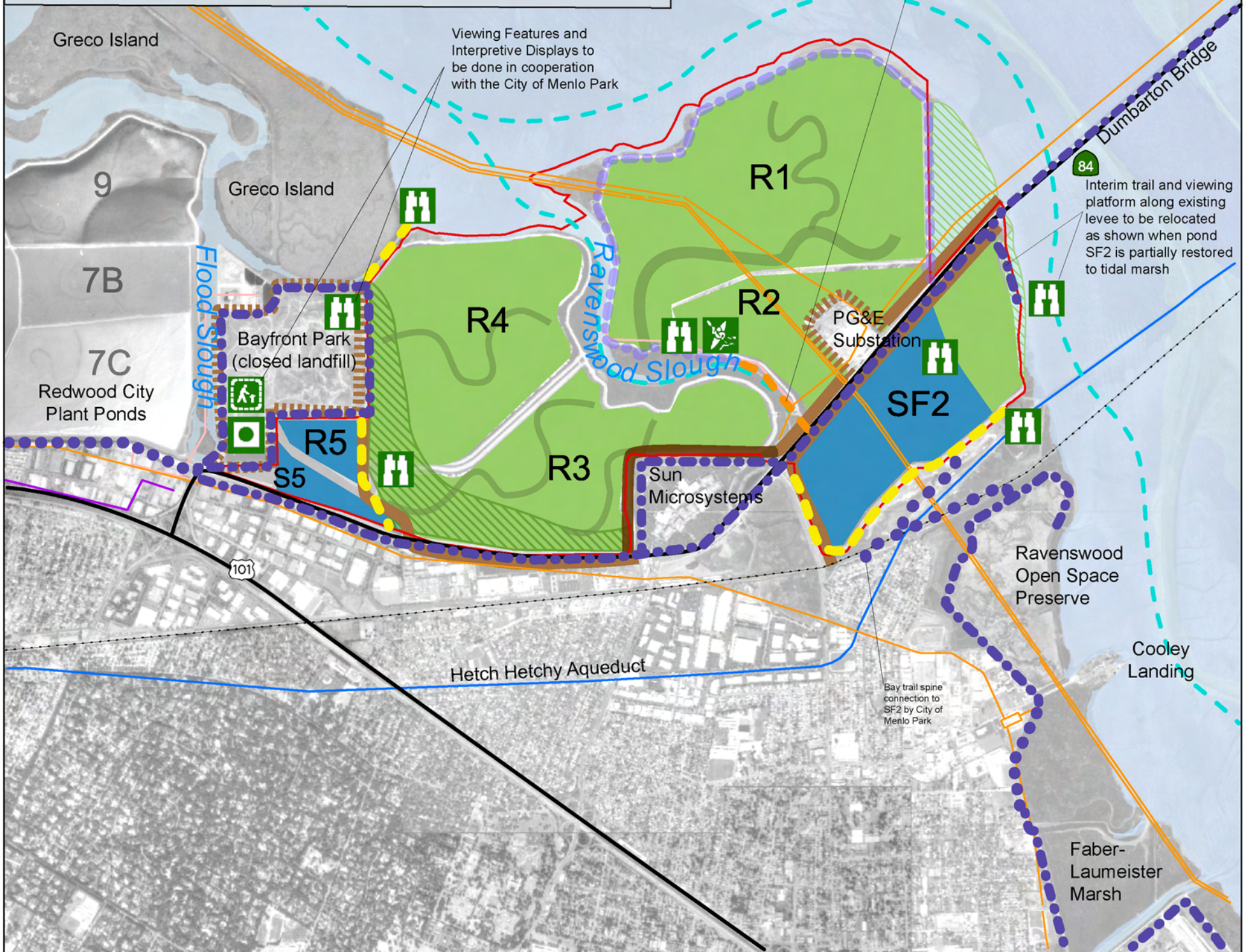
\*Level of flood protection not specified.

Note: Levees along creeks extend upstream of the endpoints shown. All levee and high ground locations are approximate.

100 Acres  
1,300 650 0 1,300 Feet  
600 300 0 600 Meters

Map datum and projection: NAD83, UTM Zone 10N  
 Map data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution lines), Cargill (pond boundaries), SFEI (baylands), EDAW (highways), NASA (South Bay Imagery), Project Boundary taken from SFEI Interactive Map  
 Map by: EDAW Inc. Map date: October, 2007

Denotes trails that were identified during the alternatives development process as being of particular concern to permitting agencies for potential to disrupt habitat.



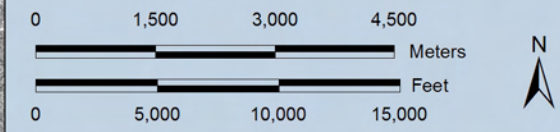


# South Bay Salt Pond Restoration Project

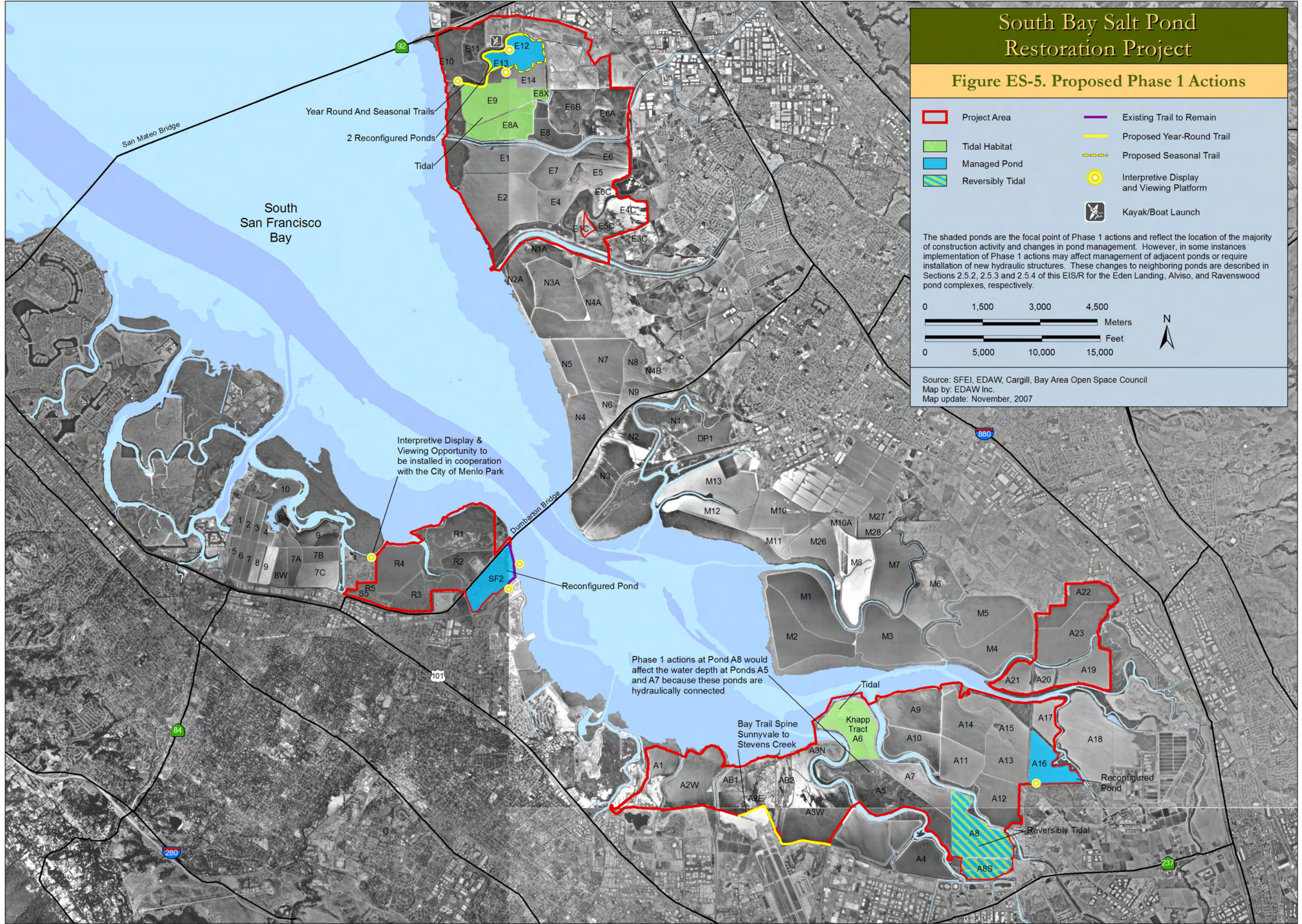
## Figure ES-5. Proposed Phase 1 Actions

- Project Area
- Existing Trail to Remain
- Tidal Habitat
- Managed Pond
- Reversibly Tidal
- Proposed Year-Round Trail
- Proposed Seasonal Trail
- Interpretive Display and Viewing Platform
- Kayak/Boat Launch

The shaded ponds are the focal point of Phase 1 actions and reflect the location of the majority of construction activity and changes in pond management. However, in some instances implementation of Phase 1 actions may affect management of adjacent ponds or require installation of new hydraulic structures. These changes to neighboring ponds are described in Sections 2.5.2, 2.5.3 and 2.5.4 of this EIS/R for the Eden Landing, Alviso, and Ravenswood pond complexes, respectively.



Source: SFEI, EDAW, Cargill, Bay Area Open Space Council  
 Map by: EDAW Inc.  
 Map update: November, 2007





### **S.1.2 South San Francisco Bay Shoreline Study**

The SBSP Restoration Project was planned in close coordination with a related but separate project, the South San Francisco Bay Shoreline Study being planned by the Corps. The Congressionally-authorized Shoreline Study will identify and recommend for federal funding one or more projects for flood damage reduction, ecosystem restoration, and related purposes such as public access. Because they have similar objectives and geographic scope and include restoration and flood management components, the planning and management of these two projects will be closely integrated. The Shoreline Study area includes the SBSP Restoration Project Area as well as shoreline and floodplain areas in the counties of Alameda, San Mateo, and Santa Clara.

Planning for the Shoreline Study will be conducted through several stages referred to as Interim Feasibility Studies, and the Corps is currently developing alternatives for the first stage of the Shoreline Study (the Alviso Ponds and Santa Clara County Interim Feasibility Study) in partnership with the Shoreline Study's non-federal sponsors, SCVWD and the Conservancy, and in cooperation with USFWS. Potential Shoreline Study actions include flood protection improvements, ecosystem restoration, and recreation and public access features, which may overlap considerably with proposed SBSP Restoration Project actions.

This EIS/R presents a preliminary list of the potential impacts associated with the possible Shoreline Study actions. This information is presented in Section 3.2 of this EIS/R to provide full public disclosure regarding a separate but closely related project that will undergo its own separate environmental review. This EIS/R does not provide program- or project-level National Environmental Policy Act (NEPA) or California Environmental Quality Act (CEQA) coverage of the Shoreline Study. The Corps and non-federal sponsors will prepare an EIS/R for the first Interim Feasibility Study component of the Shoreline Study which will incorporate this EIS/R by reference. USFWS is expected to be a joint lead agency on the Shoreline Study EIS/R. An adaptive management plan that is expected to be compatible with the SBSP Restoration Project Adaptive Management Plan will be prepared for the Shoreline Study.

## **S.2 Purpose of the EIS/R**

This EIS/R is intended to provide the public and responsible and trustee agencies with information about the potential environmental effects of the SBSP Restoration Project. It will be used by the lead agencies when considering approval of the SBSP Restoration Project, and will serve as the tiering document for future phases of the Project. Shoreline Study alternatives are not yet developed sufficiently to allow for their detailed analysis at this time. As noted above, the EIS/R accompanying each Shoreline Study Interim Feasibility Study will incorporate the SBSP Restoration Project EIS/R by reference as appropriate.

## **S.3 Type of EIS/R**

This document is both a programmatic EIS/R covering the 50-year long-range SBSP Restoration Project as well as a project-level EIS/R addressing the specific components and implementation of Phase 1 of the



SBSP Restoration Project. Future Project actions will be addressed in subsequent project-level NEPA and CEQA documents.

#### **S.4 Role of Adaptive Management in the SBSP Restoration Project**

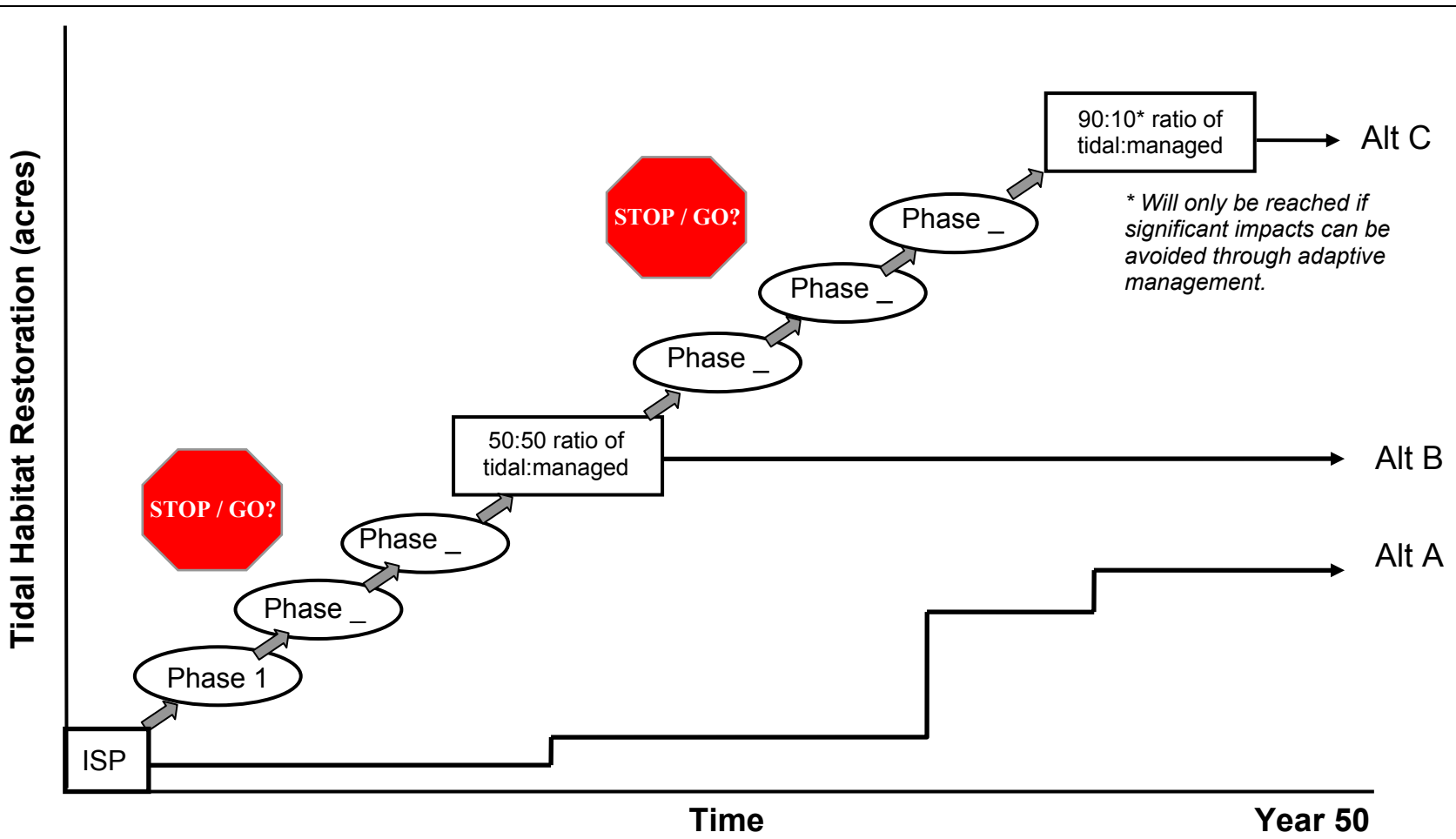
Adaptive management is an integral component of the SBSP Restoration Project. The Project would be implemented over many years and adaptive management would allow for lessons learned from earlier phases to be incorporated into subsequent phases as management plans and designs of future actions are updated. This approach to phased tidal restoration acknowledges that uncertainties exist and provides a framework for adjusting management decisions as the cause-and-effect linkages between management actions and the physical and biological response of the system are more fully understood. Adaptive management is used to maximize the ability to achieve the Project Objectives. Another key aspect of the adaptive management approach is to avoid irreversible adverse environmental impacts before they occur by triggering specific pre-planned intervention measures if monitoring reveals the ecosystem is evolving along an undesirable trajectory.

A crucial element of the Adaptive Management Plan presented in this EIS/R is a feedback loop between information generation (science) and decision-making (management) while keeping the public informed and involved in the overall process. The loop between science and management is designed to occur at every phase along the adaptive management “staircase” as shown in Figure ES-6. Additional feedback loops may occur that require modification to pond management between successive phases of additional tidal restoration. As a result of adaptive management decision-making, the ultimate mix and amount of tidal and managed pond habitats would likely lie between the two restoration bookends defined by Alternatives B and C.

The Adaptive Management Plan identifies management triggers that indicate when restoration actions may cause a significant adverse environmental impact. The management triggers are intended to provide a warning to decisionmakers before a significant impact occurs. If a management trigger is tripped, further restoration would not occur until a focused evaluation is conducted to assess if a potentially significant impact would result from the SBSP Restoration Project or other factors. If the focused evaluation determines that the SBSP Restoration Project would cause a significant impact, adaptive management action to avoid the significant impact would be implemented. Ongoing monitoring would determine the effectiveness of the adaptive management action. The Project decisionmakers would use these results to determine whether the progression along the restoration “staircase” should continue (*i.e.*, additional tidal restoration should occur). If the focused evaluation and/or monitoring results indicate that a significant impact would still occur even with implementation of the adaptive management action, then additional tidal restoration activities would cease. This could happen at any point along the restoration “staircase” between the Alternatives B and C bookends.

Consequently, the “staircase” approach, when coupled with adaptive management decisions, allows for a range of outcomes between Alternatives B and C (see Figure ES-6). The Project would only proceed to the 90:10 scenario if, when any management triggers were tripped, management actions implemented are successful in avoiding significant impacts.





ISP = Initial Stewardship Plan

Note: The number and timing of phases after Phase 1 are not defined at this time. The "stairstep" evolution of Alternative A reflects periodic unplanned pond breaches; no specific timing or magnitude of these breaches is implied.

figure ES-6

South Bay Salt Pond Restoration Project

The Adaptive Management Staircase of Tidal Habitat Restoration





While a primary role of adaptive management would be to guide Project implementation up the “staircase”, it would be essential in guiding and refining flood management and public access actions as well. In particular, flood management actions would need to be considered in light of global climate change (e.g., sea level rise) that may require frequent reconsideration of future scenarios. This would place a premium on actions that could be successfully modified as conditions change. Public access additions would be considered in the context of species response to actions and overall response to the Project actions.

## **S.5 Summary of Impacts and Mitigation Measures**

Environmental impacts of the SBSP Restoration Project are evaluated in Chapters 3 and 4 of this EIS/R. Potential impacts of the SBSP Restoration Project identified in this EIS/R are summarized in Table ES-1. Impacts are characterized based on their potential to affect the environment. The different levels of impact significance are shown below:

- Potentially Significant (PS): adverse environmental effects would occur (impacts would be above the significance criteria defined for each environmental issue), and no mitigation measures are available to reduce impacts to levels below the significance criteria;
- Less than Significant (LTS): environmental effects would not exceed the significance criteria;
- Less than Significant with Mitigation (LTSM): potentially adverse environmental effects would occur but mitigation measures would reduce adverse effects to less-than-significant levels;
- No Impact: no adverse environmental effects would occur; and
- Beneficial (B): effects would be beneficial when evaluated against the significance criteria or in terms of meeting the SBSP Restoration Project Objectives.

### **S.5.1 Impacts Resulting From Alternative A**

As shown in Table ES-1, many of the impacts for Alternative A, the No Action Alternative, would be potentially significant as no mitigation measures would be developed and implemented if no action is taken. The Adaptive Management Plan, an integral component of action Alternatives B and C that would avoid or minimize significant adverse impacts associated with the Project, would not be implemented under Alternative A.

### **S.5.2 Impacts Resulting From Alternatives B and C and the Phase 1 Actions**

#### **Potentially Significant Impacts**

As shown in Table ES-1, most of the impacts that would result from Project Alternatives B and C and the Phase 1 actions would be less than significant because the implementation of the Adaptive Management Plan would avoid many of the potentially significant impacts. Three impacts under the action alternatives (Alternatives B and C) would remain potentially significant and unavoidable, as no mitigation measures are currently available to reduce these impacts to levels below the established thresholds of significance. These potentially significant impacts are:



- **SBSP Impact 3.3-2: Increased coastal flood risk due to regional changes in Bay bathymetry and hydrodynamics (Alternatives B and C).** The increase in coastal flood risk would be less than significant landward of the SBSP Restoration Project Area. Outside of the SBSP Restoration Project Area, particularly south of the Dumbarton Bridge, changes in Bay bathymetry and hydrodynamics as a result of the Project could result in an increase in the coastal flood risk. The needs for flood protection will be evaluated in the Shoreline Study once the flood risks have been quantified, including flood risks arising from possible future restoration actions. Thus, the Shoreline Study may result in a project that would mitigate any impacts associated with changes in Bay bathymetry and hydrodynamics.
- **SBSP Impact 3.6-7: Reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations (Alternatives B and C).** Because ruddy ducks in the South Bay make little use of tidal waters, the SBSP Restoration Project would likely result in declines in ruddy duck numbers within the South Bay due to conversion of managed ponds to tidal habitats. Some ruddy ducks displaced from South Bay salt ponds that are restored to tidal habitats would likely simply shift to other areas, including other managed ponds within the SBSP Restoration Project Area (where habitat may not necessarily be limiting numbers), Cargill salt ponds, or ponds and lakes elsewhere in the South Bay.
- **SBSP Impact 3.7-2: Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature (Alternative C only).** Under Alternative C, a 2-mile portion of the 12-mile long Alameda Creek Regional Trail that provides shoreline access to hikers and equestrians along the Alameda County Flood Control Channel (ACFCC) would be removed once the north levee of the ACFCC is removed for tidal marsh restoration and flood protection. This would result in a loss of trail usage for equestrian users in the Eden Landing pond complex, which is not available elsewhere in this complex.

Please see Chapter 3 of this EIS/R for further discussion of these impacts. It is possible that future phases of the Project could be designed to avoid or minimize these potentially significant impacts. However, no feasible mitigation measures are currently available to reduce these impacts to less-than-significant levels for this program-level analysis. Subsequent project-level documentation for future phases will reevaluate these potentially significant impacts and identify design elements and/or mitigation measures that could reduce these impacts to less-than-significant levels.

### **Mitigation Measures Identified in the EIS/R**

Table ES-2 presents the mitigation measures that are identified in this EIS/R. These mitigation measures would reduce potential adverse environmental effects to less-than-significant levels in accordance with NEPA and CEQA.

### **S.5.3 Cumulative Impacts**

Table ES-3 presents the cumulative impacts identified in Chapter 4, Cumulative Impacts. The Council on Environmental Quality's (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] 1508.7) define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future



actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” CEQA provides a similar definition of cumulative impacts. For the purposes of this EIS/R, cumulative effects are considered significant if the SBSP Restoration Project’s incremental effect, though individually limited, is cumulatively considerable when viewed in connection with the effects of past, current, and probable future projects (CEQA Guidelines 15064[h][1]). Cumulative projects include the Corps’s Shoreline Study, SCVWD’s Alviso Slough Restoration Project, and PG&E’s Pond A6 Tower and Boardwalk Modification Project.

In Table ES-3, the level of significance determinations reflect the severity of the overall cumulative impacts (the SBSP Restoration Project’s effects plus the impacts of other past, present and probable future projects), *not* just the SBSP Restoration Project’s contribution to the cumulative impacts. For many of the cumulative impacts, the SBSP Restoration Project’s contribution is not considerable, but the cumulative impact is potentially significant due to the cumulative effects of this Project together with other projects. Please see Chapter 4 for further discussion of the Project’s contribution to cumulative impacts.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>3.3 Hydrology, Flood Management and Infrastructure</b>									
<b>SBSP Impact 3.3-1:</b> Potential for increased coastal flood risk landward of the SBSP Restoration Project Area.	PS	LTS, B	LTS, B	PS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.3-2:</b> Increased coastal flood risk due to regional changes in Bay bathymetry and hydrodynamics.	PS	PS	PS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.3-3:</b> Increased fluvial flood risk.	PS	LTS, B	LTS, B	PS	PS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.3-4:</b> Increased levee erosion along channel banks downstream of tidal breaches.	PS	LTS	LTS	PS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.3-5:</b> Potential interference with navigation.	LTS, B	LTS, B	LTS, B	LTS, B	LTS	LTS	LTS, B	LTS, B	LTS
<b>3.4 Surface Water, Sediment and Groundwater Quality</b>									
<b>SBSP Impact 3.4-1:</b> Changes in algal abundance and composition, which could in turn degrade water quality by lowering DO and/or promoting the growth of nuisance species.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.4-2:</b> Potential to cause localized, seasonally low DO levels as a result of algal blooms, increased microbial activity, or increased residence time of water.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.4-3:</b> Potential to mobilize, transport, and deposit mercury-contaminated sediments, leading to exceedance of numeric water quality objectives, TMDL allocations, and sediment quality guidelines for total mercury.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.4-4:</b> Potential increase in net methylmercury production and bioaccumulation in the food web.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.4-5:</b> Potential impacts to water quality from other contaminants.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTSM	LTSM	LTSM
<b>SBSP Impact 3.4-6:</b> Potential to cause seawater intrusion of regional groundwater sources.	PS	LTSM	LTSM	PS	PS	PS	LTSM	LTSM	LTSM
<b>3.5 Geology, Soils and Seismicity</b>									
<b>SBSP Impact 3.5-1:</b> Potential effects from settlement and subsidence due to consolidation of Bay mud.	PS	LTS, B	LTS, B	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.5-2:</b> Potential effects from liquefaction of soils and lateral spreading.	PS	LTS, B	LTS, B	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.5-3:</b> Potential effects from tsunami and/or seiche.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.5-4:</b> Potential for ground and levee failure from fault rupture.	PS	LTS	LTS	No Impact	PS	PS	No Impact	LTS	LTS
<b>SBSP Impact 3.5-5:</b> Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.	LTS	LTS	LTS	LTS	LTS	No Impact	LTS	LTS	No Impact

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>3.6 Biological Resources</b>									
<b>SBSP Impact 3.6-1:</b> Potential reduction in number of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	PS	LTS	LTS	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-2:</b> Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.6-3:</b> Potential habitat conversion impacts to western snowy plovers.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>SBSP Impact 3.6-4:</b> Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.	PS	LTS	LTS	PS	PS	PS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-5:</b> Potential reduction in the numbers of non-breeding, salt-pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.	PS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.6-6:</b> Potential reduction in foraging habitat for diving ducks, resulting in declines in flyway-level populations.	PS	LTS	LTS	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-7:</b> Reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations.	PS	PS	PS	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.6-8:</b> Potential habitat conversion impacts on California least terns.	LTS	LTS	LTS	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-9:</b> Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew, and further isolation of these species' populations, due to breaching activities and scour.	LTS	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-10:</b> Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	No Impact	LTS	LTS	No Impact	No Impact	No Impact	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-11:</b> Potential construction-related loss of, or disturbance to, nesting pond-associated birds.	No Impact	LTS	LTS	No Impact	No Impact	No Impact	LTS	LTS	LTS
<b>SBSP Impact 3.6-12:</b> Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	LTS, B	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-13:</b> Potential effects of habitat conversion and pond management on steelhead.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	No Impact	LTS	LTS	LTS
<b>SBSP Impact 3.6-14:</b> Potential impacts to estuarine fish.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	No Impact	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-15:</b> Potential impacts to piscivorous birds.	LTS	LTS	LTS	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-16:</b> Potential impacts to dabbling ducks.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	No Impact	LTS, B	LTS, B	LTS, B

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.6-17:</b> Potential impacts to harbor seals.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.6-18:</b> Potential recreation-oriented impacts to sensitive species and their habitats.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.6-19:</b> Potential impacts to special-status plants.	LTS, B	LTS, B	LTS, B	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.6-20:</b> Colonization of mudflats and marshplain by non-native <i>Spartina</i> and its hybrids.	LTS	LTS	LTS	LTS	LTS	No Impact	LTS	LTS	No Impact
<b>SBSP Impact 3.6-21:</b> Colonization by non-native <i>Lepidium</i> .	LTS	LTS	LTS	LTS	LTS	No Impact	LTS	LTS	LTS
<b>SBSP Impact 3.6-22:</b> Potential increase in exposure of wildlife to avian botulism and other diseases.	PS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.6-23:</b> Potential impacts to bay shrimp populations.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	No Impact	LTS, B	LTS, B	LTS, B
<b>3.7 Recreation and Public Access</b>									
<b>SBSP Impact 3.7-1:</b> Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.7-2:</b> Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and that would not be replaced in the general vicinity of the removed feature.	PS	LTS	PS	PS	PS	PS	No Impact	No Impact	No Impact
<b>3.8 Cultural Resources</b>									
<b>SBSP Impact 3.8-1:</b> Potential disturbance of known and/or unknown cultural resources.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTSM	LTSM	LTSM
<b>SBSP Impact 3.8-2:</b> Disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTSM	LTSM	LTSM
<b>3.9 Land Use</b>									
<b>SBSP Impact 3.9-1:</b> Land use compatibility impacts.	No Impact	LTS, B	LTS, B	No Impact	No Impact	No Impact	LTS, B	LTS, B	LTS, B
<b>3.10 Public Health and Vector Management</b>									
<b>SBSP Impact 3.10-1:</b> Potential increase in mosquito populations.	PS	LTS	LTS	PS	LTS	LTS	LTS	LTS	LTS
<b>3.11 Socioeconomics and Environmental Justice</b>									
<b>SBSP Impact 3.11-1:</b> Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.11-2:</b> Change lifestyles and social interactions.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.11-3:</b> Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.	PS	LTS, B	LTS, B	PS	PS	PS	LTS, B	LTS, B	LTS, B
<b>3.12 Traffic</b>									
<b>SBSP Impact 3.12-1:</b> Potential short-term degradation of traffic levels on a roadway or at an intersection due to construction.	No Impact	LTSM	LTSM	No Impact	No Impact	No Impact	LTS	LTS	LTS
<b>SBSP Impact 3.12-2:</b> Potential long-term degradation of traffic levels on a roadway or an intersection.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.12-3:</b> Potential increase in parking demand.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.12-4:</b> Potential increase in wear and tear on the designated haul routes during construction.	No Impact	LTSM	LTSM	No Impact	No Impact	No Impact	LTS	LTS	LTS
<b>3.13 Noise</b>									
<b>SBSP Impact 3.13-1:</b> Short-term construction noise effects.	No Impact	LTSM	LTSM	No Impact	No Impact	No Impact	LTSM	LTSM	LTSM
<b>SBSP Impact 3.13-2:</b> Traffic-related noise impacts during construction.	No Impact	LTSM	LTSM	No Impact	No Impact	No Impact	LTSM	LTSM	LTSM
<b>SBSP Impact 3.13-3:</b> Traffic-related noise effects during operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.13-4:</b> Potential operational noise effects from pump operation and other O&M activities.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTSM	LTSM	LTSM

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.13-5:</b> Potential vibration effects during construction and/or operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.14 Air Quality</b>									
<b>SBSP Impact 3.14-1:</b> Short-term construction-generated air pollutant emissions.	No Impact	LTSM	LTSM	No Impact	No Impact	No Impact	LTSM	LTSM	LTSM
<b>SBSP Impact 3.14-2:</b> Potential long-term operational air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.14-3:</b> Potential exposure of sensitive receptors to toxic air contaminant emissions.	LTS	LTSM	LTSM	LTS	LTS	LTS	LTSM	LTSM	LTSM
<b>SBSP Impact 3.14-4:</b> Potential odor emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.15 Public Services</b>									
<b>SBSP Impact 3.15-1:</b> Increased demand for fire and police protection services.	LTS	LTS	LTS	No Impact	No Impact	No Impact	LTS	LTS	LTS
<b>3.16 Utilities</b>									
<b>SBSP Impact 3.16-1:</b> Reduced ability to access PG&E towers, stations or electrical transmission lines.	LTS	LTS	LTS	No Impact	LTS	No Impact	No Impact	LTS	LTS
<b>SBSP Impact 3.16-2:</b> Reduced clearance between waterways and PG&E electrical transmission lines.	LTS	LTS	LTS	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
<b>SBSP Impact 3.16-3:</b> Reduced structural integrity of PG&E towers.	PS	LTS	LTS	No Impact	LTS	PS	No Impact	LTS	LTS

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-1 SBSP Restoration Project EIS/R Summary Impact Table (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>SBSP Impact 3.16-4:</b> Changes in water level, tidal flow and sedimentation near storm drain systems.	PS	LTS	LTS	LTS	LTS	No Impact	LTS	LTS	No Impact
<b>SBSP Impact 3.16-5:</b> Changes in water level, tidal flow and sedimentation near pumping facilities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.16-6:</b> Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.	LTS	LTS	LTS	LTS	LTS	LTS	No Impact	LTS	No Impact
<b>SBSP Impact 3.16-7:</b> Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>SBSP Impact 3.16-8:</b> Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	LTS	LTSM	LTSM	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
<b>SBSP Impact 3.16-9:</b> Reduced access to sewer force mains due to levee construction.	No Impact	LTS	LTS	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
<b>3.17 Aesthetics</b>									
<b>SBSP Impact 3.17-1:</b> Alter views of the SBSP Restoration Project Area.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>SBSP Impact 3.17-2:</b> Alter the existing visual character of the Project Area and its surroundings.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B

PS = Potentially Significant; LTS = Less than Significant; LTSM = Less than Significant with Mitigation; B = Beneficial

Note: The levels of significance for the impacts listed above assume that the Adaptive Management Plan is an integral component of the Project, and that management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C in this table would be potentially significant.



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<b>3.3 Hydrology, Flood Management and Infrastructure</b>		
	None	
<b>3.4 Surface Water, Sediment and Groundwater Quality</b>		
<p><b>SBSP Impact 3.4-5:</b> Potential impacts to water quality from other contaminants.</p>	<p><b>SBSP Mitigation Measure 3.4-5a:</b> Stormwater Pollution Prevention Plan.</p> <p>This mitigates potential impacts due to construction related-activities and maintenance activities. The Project sponsors will obtain authorization from the RWQCB prior to beginning construction. As part of this application, the Project sponsors will prepare a Stormwater Pollution Prevention Plan (SWPPP) and require all construction contractors to implement BMPs identified in the SWPPP for controlling soil erosion and discharges of other construction-related contaminants. Routine monitoring and inspection of BMPs will be conducted to ensure that the quality of stormwater discharges is in compliance with the permit.</p> <p>BMPs that will appear in the SWPPP include:</p> <ul style="list-style-type: none"> <li>▪ Soil stabilization measures, such as preservation of existing vegetation and use of mulch or temporary plantings to minimize soil disturbance;</li> <li>▪ Sediment control measures to prevent disturbed soils from entering waterways;</li> <li>▪ Tracking control measures to reduce sediments that leave the construction site on vehicle or equipment tires; and</li> <li>▪ Nonstormwater discharge control measures, such as monitoring water quality of dewatering operations and hazardous material delivery, storage, and emergency spill response requirements, and measures by the Project sponsors to ensure that soil-excavation and movement activities are conducted in accordance with standard BMPs regarding excavation and dredging of bay muds as outlined in BCDC’s bay dredge guidance documents. These include excavating channels during low tide; using dredge equipment, such as sealing clamshell buckets, designed to minimize escape of the fine grained materials; and testing dredge materials for contaminants.</li> </ul> <p>The contractor will select specific BMPs from each area, with Project sponsor approval, on a site-specific basis. The construction general contractor will ensure that the BMPs are implemented as appropriate throughout the duration of construction and will be responsible for subcontractor compliance with the SWPPP requirements.</p> <p>Other impacts due to construction-related and maintenance activities can be mitigated by appropriate additions to stormwater pollution prevention plans, including a plan for safe refueling of vehicles and spill containment plans. An appropriate hazardous materials management plan will be developed for any activity that involves handling, transport or removal of hazardous materials.</p>	<p>B, C, Phase 1 Actions</p>



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	<p><b>SBSP Mitigation Measure 3.4-5b: Selenium Management.</b></p> <p>This mitigates potential impacts from intrusion of selenium from high-selenium aquifers. As noted in Section 3.4.2, tissue-based selenium standards are currently being developed for the state of California by USEPA as part of updating the California Toxics Rule. Adoption by the state will include a plan and program of implementation. The timeline for this process is uncertain. It will likely take longer than the time to complete this EIS/R process, but is also likely to be completed before the end of the 50 year lifetime of the SBSP Restoration Project. Selenium standards and monitoring requirements will be addressed thorough the RWQCB Waste Discharge Requirements. As long as state policies and regulations are followed in the implementation of emerging selenium objectives, there will be no significant impacts to water quality. Based on experiences in other watersheds, the Project can expect that emerging selenium regulations will require:</p> <ul style="list-style-type: none"> <li>▪ Monitoring chemical forms of selenium in water and sediments;</li> <li>▪ Monitoring selenium in the food web; the National Science Panel recommended leveraging of existing monitoring programs to monitor selenium in bivalves in the Bay.</li> <li>▪ Development of food web models linking concentrations in water and sediments to concentrations in biota; and</li> <li>▪ Development of management plans to avoid harmful selenium bioaccumulation.</li> </ul>	B, C, Phase 1 Actions
	<p><b>SBSP Mitigation Measure 3.4-5c: Actions to Minimize Illegal Discharge and Dumping.</b></p> <p>This mitigation addresses illegal discharge and dumping. The likelihood of increasing frequency of illegal discharge and dumping will be minimized with adequate public education and outreach, patrolling of the area, readily accessible and frequently serviced trash and recyclable materials receptacles, and timely clean-up activities. Specifically, the Project will undertake the following activities to ensure that existing programs and practices avoid impacts due to illegal discharge and dumping:</p> <ul style="list-style-type: none"> <li>▪ Gate structures upstream of the Project Area will include a trash capture device that will prevent fouling of marsh and pond complexes;</li> <li>▪ Plans for recreational access in the Project Area will include appropriate trash collection receptacles and a plan for ensuring regular collection and servicing; and</li> <li>▪ “No Littering” signs will be posted in public access areas.</li> </ul>	B, C, Phase 1 Actions



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	<p><b>SBSP Mitigation Measure 3.4-5d:</b> Monitoring Sediments to Follow Existing Guidance and Comply with Emerging Regulations.</p> <p>This mitigation addresses potential impacts due to mobilization and transport of particle-associated pollutants. The Project will monitor contaminant concentrations in sediments whenever activities will involve moving, transporting, or emplacing soils and sediments or exposing older sediments by dredging and excavation. Existing guidance for the beneficial re-use of sediments establishes numeric screening guidelines for the placement of sediments in direct contact with water or at buried beneath a cover layer. This guidance may be refined by the State's emerging program of Sediment Quality Objectives. Monitoring data will be used to follow existing guidance and follow emerging regulations for the placement of sediments and other activities that affect mobilization and transport of sediments. This translates to the following specific actions:</p> <ul style="list-style-type: none"> <li>▪ Sediment monitoring data will be used to determine appropriate disposal or beneficial re-use practices for sediments. If sediment monitoring data indicate that tidal scour outside a levee breach could remobilize sediments that are significantly more contaminated than Bay ambient conditions, the Project will consult with the appropriate regulatory agencies regarding other potential required actions.</li> </ul>	B, C, Phase 1 Actions
	<p><b>SBSP Mitigation Measure 3.4-5e:</b> Urban Runoff Management.</p> <p>This mitigation addresses potential impacts due to increased interaction of urban runoff with the Project Area. The RWQCB has a coordinated program of permitting and enforcement for regulating urban runoff discharge. As long as policies and regulations prohibiting the discharge of constituents causing pollution are carried out, significant impacts from urban runoff will be avoided.</p> <p>The Project proponents will notify the appropriate Urban Runoff Program of any physical changes (such as breaches) that will introduce urban discharges into the Project Area, and request that the Urban Runoff Program consider those changes when developing annual monitoring plans.</p>	B, C, Phase 1 Actions
	<p><b>SBSP Mitigation Measure 3.4-5f:</b> Bacteria Monitoring and Risk Communication.</p> <p>This mitigation addresses for potential impacts due to bacterial growth in restored areas. The SBSP Restoration Project's National Science Panel recommended that monitoring be conducted for avian botulism and bivalve disease and toxicity to humans. Mitigation measures for avian botulism are discussed under SBSP Impact 3.6-22. The Project will consider the need for additional monitoring of shellfish as each phase is implemented. For protection of public health, a program of public outreach and communication will be developed and implemented. The program will include posting of warning signs in multiple languages where monitoring data indicate the need to advise the public of exposure risks from swimming or shellfish consumption.</p>	B, C, Phase 1 Actions



**Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)**

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<p><b>SBSP Impact 3.4-6:</b> Potential to cause seawater intrusion of regional groundwater sources.</p>	<p><b>SBSP Mitigation Measure 3.4-6:</b> USFWS and CDFG (Project proponents) will coordinate with ACWD and SCVWD to ensure that the following activities take place:</p> <ul style="list-style-type: none"> <li>▪ If any abandoned wells are found before or during construction they will be properly destroyed by the Project as per local and State regulations by coordinating such activities with the local water district. If abandoned wells are located during restoration or other future activities within ACWD or SCVWD boundaries, a well destruction work plan will be prepared in consultation with ACWD or SCVWD (as appropriate) to ensure conformance to ACWD or SCVWD specifications. The work plan will include consulting the databases of well locations already provided by ACWD and SCVWD. The Project will properly destroy both improperly abandoned wells and existing wells within the Project Area that are subject to inundation by breaching levees. Well destruction methods will meet local, county and state regulations. The Project proponents will also lend support and cooperation with any well identification and destruction program that may be undertaken as part of the Shoreline Study or other projects;</li> <li>▪ The Project proponents will assist ACWD and SCVWD to obtain funding for the development, implementation, analysis and reporting of groundwater levels and groundwater quality adjacent to the Project boundaries. If groundwater monitoring detects seawater intrusion, the Project proponents will participate and assist ACWD and SCVWD in identifying the sources and causes, and in selecting and implementing an appropriate mitigation measure; and</li> <li>▪ The Project will work to assist ACWD and SCVWD in the development and implementation of communication and outreach strategies that ensure groundwater users are informed on groundwater levels, quality, usage, and the linkage between groundwater overdraft and salinity intrusion. Groundwater data will be shared with groundwater users to the extent allowed by law.</li> </ul> <p>All of these mitigation actions are coordination and communication activities that require voluntary participation of the water agencies. An advantage of Alternatives B and C over the No Action Alternative with respect to SBSP Impact 3.4-6 is that Project activities would motivate regional coordination concerning groundwater protection over the 50-year Project lifetime through these mitigation measures.</p>	<p>B, C, Phase 1 Actions</p>
<b>3.5 Geology, Soils and Seismicity</b>		
	None	
<b>3.6 Biological Resources</b>		
	None	



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<b>3.7 Recreational Resources</b>		
	None	
<b>3.8 Cultural Resources</b>		
<p><b>SBSP Impact 3.8-1:</b> Potential disturbance of known and/or unknown cultural resources.</p>	<p><b>SBSP Mitigation Measure 3.8-1:</b> Discovery of Unknown Resources.</p> <p><i>Background.</i> Restoration actions planned for the SBSP Restoration Project Area shall be treated as individual archaeological projects. The overall record search for this EIS/R was performed in June 2006. A new record search shall be performed for any projects within the SBSP Restoration Project Area where the previous record search is more than five years old.</p> <p><i>Site Survey.</i> Prior to the beginning of any Project construction activity that could affect the previously unsurveyed portions of the Project Area, qualified professional archaeologists shall be retained to inventory all portions of the restoration site that have not been examined previously or have not been examined within the last 15 years. The survey(s) shall be conducted during a time when the ground surfaces of potential project sites are visible so the natural ground surface can be examined for traces of prehistoric and/or historic-era cultural resources. If the survey(s) reveals the presence of cultural resources on the Project site (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, and structure/building remains), and those resources have not been dealt with sufficiently in any Cultural Landscape documentation, the resources shall be documented according to current professional standards. The resources shall be evaluated for potential eligibility to the NRHP or CRHR. Depending on the evaluation, additional mitigation measures may be required, including avoidance of the resource through changes in construction methods or Project design or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements.</p> <p><i>Pre-Construction Contractor Education.</i> Prior to any Project-related construction, a professional archaeologist shall be retained to address machinery operators and their supervisors, preferably by giving an on-site talk to the people who will perform the actual earth-moving activities. This will alert the operators to the potential for finding historic or prehistoric cultural resources.</p> <p><i>Construction Monitoring.</i> Any Project-related construction that occurs within 100 ft (30 m) of a known prehistoric resource shall be monitored by a qualified professional archaeologist and a Native American monitor. If elements of the known resource or previously unknown cultural resources are encountered during Project construction, all ground-disturbing activities shall halt within a 100-ft radius of the find. The archaeologist shall identify the materials, determine their possible significance, and formulate appropriate measures for their treatment in consultation with the Native American monitor, Most Likely Descendant (MLD), or appropriate Native American representative and the appropriate Lead Agency. Potential treatment methods for significant</p>	<p>B, C, Phase 1 Actions</p>



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	<p>and potentially significant resources may include, but would not be limited to, no action (<i>i.e.</i>, resources determined not to be significant), avoidance of the resource through changes in construction methods or Project design, or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. These measures shall be implemented prior to resumption of Project construction.</p> <p><u>Unanticipated Finds.</u> If contractors identify possible cultural resources, such as unusual amounts of bone, stone, or shell, they shall be instructed to halt operation in the vicinity of the find and follow the appropriate contact procedures. Work shall not resume in the vicinity of the find until a qualified professional archaeologist has had the opportunity to examine the finds. The archaeologist shall identify the materials, determine their possible significance, if the finds are prehistoric, formulate appropriate measures for their treatment in consultation with the Native American monitor, MLD, or appropriate Native American representative and the appropriate Lead Agency. Potential treatment methods for significant and potentially significant resources may include, but would not be limited to, no action (<i>i.e.</i>, resources determined not to be significant), avoidance of the resource through changes in construction methods or Project design, or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. These measures shall be implemented prior to resumption of Project construction.</p> <p><u>Human Remains.</u> California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code Section 7050.5 and Section 7052 and California Public Resources Code Section 5097. The California Health and Safety Code requires that if human remains are found in any location other than a dedicated cemetery, work is to be halted in the immediate area.</p> <p>The appropriate Agency or the Agency's designated representative shall be notified. The Agency shall immediately notify the county coroner and a qualified professional archaeologist. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American interment, then coroner shall contact the Native American Heritage Commission within 24 hours.</p> <p>The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods, as provided in Public Resources Code Section 5097.98. The landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if: (1) the Native American Heritage Commission is unable to identify a MLD or (2) the MLD fails to make a</p>	



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	recommendation within 24 hours after being notified by the commission or (3) if the landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.	
<b>SBSP Impact 3.8-2:</b> Disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	<b>SBSP Mitigation Measure 3.8-2:</b> Cultural Landscape, Inventory of Resources, Treatment of Finds. <i>Cultural Landscape.</i> Prior to implementation of any restoration action, a qualified professional shall be retained to determine whether the various salt works-related ponds, buildings, objects, and structures lining the southern San Francisco Bay will be reviewed as a cultural landscape within the historic context and evaluation framework developed for this Project. This will be done for each Project phase. If a cultural landscape is identified, a determination must be made concerning NRHP and/or CRHR eligibility.  If the landscape is determined to be eligible for listing to the NRHP and/or CRHR, an assessment of the Project's effects on the landscape will be conducted. This study shall include documentation of contributing elements to the resources, a list of non-contributing elements, and recommendations regarding any additional mitigation or treatment needed. Mitigation measures may include tasks such as Historic American Building Survey <sup>1</sup> / Historic American Engineering Record <sup>2</sup> / Historic American Landscapes Survey <sup>3</sup> (HABS/HAER/HALS) documentation, videotaping resources, a public outreach program, or signage at appropriate points along the proposed recreational trails.	B, C, Phase 1 Actions
<b>Phase 1 Impact 3.8-1:</b> Potential disturbance of known or unknown cultural resources.	<b>Phase 1 Mitigation Measure 3.8-1:</b> Protection for Site ALA-593H If ALA-593H (at Ponds E12 and E13) is determined to be eligible for listing to either the NRHP or CRHR, it shall be capped with soil or other appropriate materials and planted with vegetation similar to that found elsewhere on the levee to protect it.	Phase 1 Actions
<b>3.9 Land Use</b>		
	None	

<sup>1</sup> The Historic American Buildings Survey (HABS) is the nation's first federal preservation program, begun by the American Institute of Architects, the Library of Congress, and NPS in 1933 to document America's architectural heritage. HABS recording combines drawings, history, and photography to produce a comprehensive, interdisciplinary record. The documentation ranges in scope depending largely upon the level of significance and complexity.

<sup>2</sup> The Historic American Engineering Record (HAER) was established in 1969 by the NPS, the American Society of Civil Engineers and the Library of Congress to document historic sites and structures related to engineering and industry. Appropriate subjects for documentation are individual sites or objects, such as a bridge, ship, or steel works; or larger systems, like railroads, canals, electronic generation and transmission networks, parkways and roads.

<sup>3</sup> The Historic American Landscapes Survey (HALS) mission is to record historic landscapes in the United States and its territories through measured drawings and interpretive drawings, written histories, and large-format black and white photographs and color photographs.



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<b>3.10 Public Health and Vector Management</b>		
	None	
<b>3.11 Socioeconomics and Environmental Justice</b>		
	None	
<b>3.12 Traffic</b>		
<b>SBSP Impact 3.12-1:</b> Potential short-term degradation of traffic levels on a roadway or at an intersection due to construction.	<b>SBSP Mitigation Measure 3.12-1:</b> Timing of construction-related truck trips.  The landowners (CDFG and USFWS) shall include in construction plans and specifications the requirement that construction-related truck trips, specifically deliveries of fill and equipment, shall occur outside the weekday am and pm peak commute traffic hours.	B, C
<b>SBSP Impact 3.12-3:</b> Potential increase in parking demand.	<b>SBSP Mitigation Measure 3.12-3:</b> Parking at recreational facilities.  The Landowners (CDFG and USFWS), in coordination with the cities with jurisdiction over the proposed recreation improvements (where applicable), shall design recreational facilities with sufficient parking spaces to accommodate the projected increase in vehicles that access the site, unless adequate off-site parking is available to offset the demand for parking spaces.	B, C
<b>SBSP Impact 3.12-4:</b> Potential increase in wear and tear on the designated haul routes during construction.	<b>SBSP Mitigation Measure 3.12-4:</b> Videotape road conditions.  If residential streets are part of the designated haul route for any future phases of the SBSP Restoration Project, the landowners shall prepare a videotape of road conditions prior to the start-up of construction for the residential streets affected by the Project. The landowners (CDFG and USFWS) shall prepare a similar videotape of road conditions after Project construction is completed. The pre- and post-construction conditions of haul routes shall be reviewed by staff of the local Public Works Department. An agreement shall be entered into prior to construction that will detail the pre-construction conditions and post-construction requirements of the roadway rehabilitation program.	B, C



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<b>3.13 Noise</b>		
<p><b>SBSP Impact 3.13-1:</b> Short-term construction noise effects.</p>	<p><b>SBSP Mitigation Measure 3.13-1:</b> Short-term noise effects.</p> <p>The landowners shall include in construction plans and specifications the following requirement:</p> <ul style="list-style-type: none"> <li>▪ All construction activities shall be limited to the days and hours or noise levels designated for each jurisdiction where work activities occur, as specified below;               <ul style="list-style-type: none"> <li><u>Eden Landing</u> <ul style="list-style-type: none"> <li>○ City of Hayward: construction activities shall occur between 7 am and 7 pm Monday through Saturday and 10 am to 6 pm Sunday and holidays only.</li> </ul> </li> <li><u>Alviso</u> <ul style="list-style-type: none"> <li>○ City of San Jose: construction activities shall not exceed 55 dBA at residential-zoned districts except upon issuance of and in compliance with a Conditional Use Permit;</li> <li>○ City of Fremont: there are no restrictions for temporary construction activities;</li> <li>○ City of Sunnyvale: construction activities shall occur between 7 am and 6 pm Monday through Friday and 8 am to 5 pm on Saturday. Construction activities shall not occur during Sunday or national holidays;</li> <li>○ Santa Clara County: construction activities shall occur during the daytime hours of 7 am to 7 pm Monday through Saturday, except legal holidays; and</li> <li>○ City of Mountain View: construction activities shall occur between 7 am and 6 pm Monday through Friday. Construction activities shall not occur during Saturdays, Sundays or holidays unless prior written approval is granted by the building official.</li> </ul> </li> <li><u>Ravenswood</u> <ul style="list-style-type: none"> <li>○ City of Menlo Park: construction activities shall occur between 8 am and 6 pm Monday through Friday only.</li> </ul> </li> </ul> </li> <li>▪ Locate all construction equipment staging areas at the furthest distance possible from nearby noise-sensitive land uses; and</li> <li>▪ Construction equipment shall be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications.</li> </ul>	<p>B, C, Phase 1 Actions</p>



Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<p><b>SBSP Impact 3.13-2:</b> Traffic-related noise impacts during construction.</p>	<p><b>SBSP Mitigation Measure 3.13-2:</b> Traffic-related noise.</p> <p>The landowners shall include in construction plans and specifications the following requirement:</p> <ul style="list-style-type: none"> <li>▪ Contractors shall use haul routes that minimizes traffic through residential areas. Material hauling shall be conducted during the day-time hours only as specified in SBSP Mitigation Measure 3.13-1; and</li> <li>▪ A portion of the fill for the construction of the proposed levees that provide flood protection and/or habitat features shall be transported via barge. The percentage of fill transported by barge shall be determined when the amount of construction fill required for each phase of construction has been determined. The contractor shall determine the portion of fill that will be conveyed by barge based on an assessment of the land uses along proposal haul routes.</li> </ul>	<p>B, C, Phase 1 Actions</p>
<p><b>SBSP Impact 3.13-4:</b> Potential operational noise effects from pump operation and other O&amp;M activities.</p>	<p><b>SBSP Mitigation Measure 3.13-4:</b> Operation of portable pumps.</p> <ul style="list-style-type: none"> <li>▪ Where portable pumps would be operated in the vicinity of sensitive receptors such that noise levels would exceed noise standards established by affected jurisdictions, the landowners shall enclose the portable pump to ensure that a reduction of up to 10 dB at 50 ft (15 m) is achieved and the noise levels of affected jurisdictions are met.</li> </ul>	<p>B, C</p>
<b>3.14 Air Quality</b>		
<p><b>SBSP Impact 3.14-1:</b> Short-term construction-generated air pollutant emissions.</p>	<p><b>SBSP Mitigation Measure 3.14-1:</b> Short-Term Construction-Generated Emissions.</p> <p>The following Basic Control Measures shall be implemented at all construction sites within the Project Area, regardless of size:</p> <ul style="list-style-type: none"> <li>▪ Water all active construction areas at least twice daily, and more often during times of high wind;</li> <li>▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 ft (0.6 m) of freeboard;</li> <li>▪ Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;</li> <li>▪ Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites; and</li> <li>▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.</li> </ul> <p>The following Enhanced Measures shall be implemented at construction sites larger than four acres:</p> <ul style="list-style-type: none"> <li>▪ Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);</li> </ul>	<p>B, C</p>

**Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)**

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	<ul style="list-style-type: none"> <li>▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (e.g., dirt, sand);</li> <li>▪ To the extent practicable, limit traffic speeds on unpaved roads to 15 mph;</li> <li>▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways;</li> <li>▪ Replant vegetation in disturbed areas as quickly as possible; and</li> <li>▪ Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.</li> </ul> <p>These additional “Optional Measures” shall be implemented if further emission reductions are deemed necessary by the USFWS, CDFG, or BAAQMD:</p> <ul style="list-style-type: none"> <li>▪ Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph; and</li> <li>▪ Limit the area subject to excavation, grading and other construction activity at any one time.</li> </ul> <p>According to BAAQMD, if the required mitigation measures are implemented during project construction, short-term generated emissions would be reduced to a less-than-significant level.</p>	
<p><b>SBSP Impact 3.14-3:</b> Potential exposure of sensitive receptors to toxic air contaminant emissions.</p>	<p><b>SBSP Mitigation Measure 3.14-3a:</b> TAC emissions from construction within 500 ft (152 m) of sensitive receptors will require the following:</p> <ul style="list-style-type: none"> <li>▪ Pursuant to BAAQMD Rule 6, the Project shall ensure that emissions from all off-road diesel-powered equipment used on the Project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately, and USFWS, CDFG, and BAAQMD shall be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the Project, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. BAAQMD and/or other officials may conduct periodic site inspections to determine compliance.</li> <li>▪ USFWS and CDFG shall provide a plan for approval by BAAQMD demonstrating that the heavy-duty (more than 50 horsepower) off-road vehicles to be used in the construction Project, including owned, leased, and subcontractor vehicles, would achieve a Project-wide fleet average 45 percent particulate reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels (e.g., Lubrizol, Puri NO<sub>x</sub>, biodiesel fuel) in all heavy duty off-road equipment.</li> <li>▪ USFWS and CDFG shall require in construction plans and specifications that the model year of all off-road construction moving equipment shall not be older than 1996.</li> </ul>	<p>B, C</p>



**Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)**

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
	<ul style="list-style-type: none"> <li>▪ USFWS and CDFG shall require in construction plans and specifications a provision that prohibits contractors from operating pre-1996 heavy-duty diesel equipment on forecast Spare-the-Air Days or on days when air quality advisories are issued because of special circumstances (<i>e.g.</i>, wildfires, industrial fires).</li> <li>▪ USFWS and CDFG shall minimize idling time to 10 minutes for all heavy-duty equipment when not engaged in work activities, including on-road haul trucks while being loaded or unloaded on-site.</li> <li>▪ Staging areas and equipment maintenance activities shall be located as far from sensitive receptors as possible.</li> </ul> <p>In addition, where feasible and applicable, USFWS and CDFG shall do the following:</p> <ul style="list-style-type: none"> <li>▪ Establish an activity schedule designed to minimize traffic congestion around the construction site</li> <li>▪ Periodically inspect construction sites to ensure construction equipment is properly maintained at all times.</li> <li>▪ Require the use of low sulfur fuel (diesel with 15 parts per million or less)</li> <li>▪ Utilize EPA-registered particulate traps and other appropriate controls to reduce emissions of diesel particulate matter and other pollutants at the construction site.</li> </ul>	
	<p><b>SBSP Mitigation Measure 3.14-3b: Health and Safety Plan</b></p> <p>The landowners and/or its contractors shall prepare a Health and Safety Plan that includes Project-specific monitoring procedures and action levels for dust. The portion of the plan that relates to the control of toxic contaminants contained in fugitive dust shall be prepared in coordination with BAAQMD. The recommendations of BAAQMD to prevent the exposure of sensitive receptors to levels above applicable thresholds (probability of contracting cancer for MEI that exceeds 10 in one million or if ground level concentrations of non-carcinogenic contaminants result in hazard index greater than one for the MEI) shall be implemented. The Health and Safety Plan, applicable to all excavation activities, shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials (including notification procedures to nearby sensitive receptors within 1,000 ft informing them of construction activities that may generate dust containing toxic contaminants). The plan shall be prepared according to federal and California OSHA regulations. The landowners and/or its contractors shall maintain a copy of the Plan on-site during construction activities.</p>	B, C
<b>3.15 Public Services</b>		
	None	

Table ES-2 Mitigation Measures Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	MITIGATION MEASURE	PROGRAM ALTERNATIVE/ PHASE 1 ACTION
<b>3.16 Utilities</b>		
<b>SBSP Impact 3.16-8:</b> Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	<b>SBSP Mitigation Measure 3.16-8:</b> The Landowners shall coordinate with UPRR on the design of the UPRR improvements to ensure that rail service is maintained during construction of flood control and restoration elements in and around Pond A16.	
<b>3.17 Aesthetics</b>		
	None	



Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>3.3 Hydrology and Flood Management</b>									
<b>Cumulative Impact 3.3-1:</b> Potential for increased coastal flood risk landward of the SBSP Restoration Project Area.	PS	LTS, B	LTS, B	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.3-2:</b> Increased coastal flood risk due to regional changes in Bay bathymetry and hydrodynamics.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.3-3:</b> Increased fluvial flood risk.	PS	LTS, B	LTS, B	PS	PS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.3-4:</b> Increased levee erosion along channel banks downstream of tidal breaches.	PS	LTS	LTS	PS	PS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.3-5:</b> Potential interference with navigation.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>3.4 Surface Water, Sediment and Groundwater Quality</b>									
<b>Cumulative Impact 3.4-1:</b> Changes in algal abundance and composition, which could in turn degrade water quality by lowering DO and/or promoting the growth of nuisance species.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.4-2:</b> Potential to cause localized, seasonally low DO levels as a result of algal blooms, increased microbial activity, or increased residence time of water.	PS	LTS	LTS	PS	PS	PS	PS	PS	PS

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.

Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.4-3:</b> Potential to mobilize, transport, and deposit mercury-contaminated sediments, leading to exceedance of numeric water quality objectives, TMDL allocations, and sediment quality guidelines for total mercury.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.4-4:</b> Potential increase in net methylmercury production and bioaccumulation in the food web.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.4-5:</b> Potential impacts to water quality from other contaminants.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.4-6:</b> Potential to cause seawater intrusion of regional groundwater sources.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>3.5 Geology, Soils and Seismicity</b>									
<b>Cumulative Impact 3.5-1:</b> Potential effects from settlement and subsidence due to consolidation of Bay Mud.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>Cumulative Impact 3.5-2:</b> Potential effects from liquefaction of soils and lateral spreading.	PS	LTS, B	LTS, B	PS	PS	PS	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.5-3:</b> Potential effects from tsunami and/or seiche.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.5-4:</b> Potential for ground and levee failure from fault rupture.	PS	LTS	LTS	LTS	PS	PS	LTS	LTS	LTS

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Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.5-5:</b> Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.6 Biological Resources</b>									
<b>Cumulative Impact 3.6-1:</b> Potential reduction in number of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.6-2:</b> Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.6-3:</b> Potential habitat conversion impacts to western snowy plovers.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-4:</b> Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-5:</b> Potential reduction in the numbers of non-breeding, salt pond-associated birds (e.g., phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.	PS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-6:</b> Potential reduction in foraging habitat for diving ducks, resulting in declines in flyway-level populations.	PS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.

Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.6-7:</b> Reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations.	PS	PS	PS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-8:</b> Potential habitat conversion impacts on California least terns.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-9:</b> Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew, and further isolation of these species' populations, due to breaching activities and scour.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.6-10:</b> Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-11:</b> Potential construction-related loss of, or disturbance to, nesting pond-associated birds.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-12:</b> Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.6-13:</b> Potential effects of habitat conversion and pond management on steelhead.	LTS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.6-14:</b> Potential impacts to estuarine fish.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.



Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.6-15:</b> Potential impacts to piscivorous birds.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-16:</b> Potential impacts to dabbling ducks.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.6-17:</b> Potential impacts to harbor seals.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.6-18:</b> Potential recreation-oriented impacts to sensitive species and their habitats.	LTS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-19:</b> Potential impacts to special-status plants.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-20:</b> Colonization of mudflats and marshplain by non-native <i>Spartina</i> and its hybrids.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-21:</b> Colonization by non-native <i>Lepidium</i> .	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-22:</b> Potential increase in exposure of wildlife to avian botulism and other diseases.	PS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.6-23:</b> Potential impacts to bay shrimp populations.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>3.7 Recreation and Public Access</b>									
<b>Cumulative Impact 3.7-1:</b> Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.

Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.7-2:</b> Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and which would not be replaced in the general vicinity of the removed feature.	LTS	LTS	PS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.8 Cultural Resources</b>									
<b>Cumulative Impact 3.8-1:</b> Potential disturbance of known and/or unknown cultural resources.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.8-2:</b> Disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>3.9 Land Use</b>									
<b>Cumulative Impact 3.9-1:</b> Land use compatibility impacts.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.10 Public Health and Vector Management</b>									
<b>Cumulative Impact 3.10-1:</b> Potential increase in mosquito populations.	PS	LTS, B	LTS, B	LTS	LTS	LTS	LTS, B	LTS, B	LTS, B
<b>3.11 Socioeconomics and Environmental Justice</b>									
<b>Cumulative Impact 3.11-1:</b> Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.11-2:</b> Change lifestyles and social interactions.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.



Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.11-3:</b> Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>3.12 Traffic</b>									
<b>Cumulative Impact 3.12-1:</b> Potential short-term degradation of traffic levels on a roadway or at an intersection due to construction.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.12-2:</b> Potential long-term degradation of traffic levels on a roadway or an intersection.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.12-3:</b> Potential increase in parking demand.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.12-4:</b> Potential increase in wear and tear on the designated haul routes during construction.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>3.13 Noise</b>									
<b>Cumulative Impact 3.13-1:</b> Short-term construction noise effects.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.13-2:</b> Traffic-related noise impacts during construction.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.13-3:</b> Traffic-related noise effects during operation.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.13-4:</b> Potential operational noise effects from pump operation and other O&M activities.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.

Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.13-5:</b> Potential vibration effects during construction and/or operation.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>3.14 Air Quality</b>									
<b>Cumulative Impact 3.14-1:</b> Short-term construction-generated air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.14-2:</b> Potential long-term operational air pollutant emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.14-3:</b> Potential exposure of sensitive receptors to toxic air contaminant emissions.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.14-4:</b> Potential odor emissions.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.15 Public Services</b>									
<b>Cumulative Impact 3.15-1:</b> Increased demand for fire and police protection services.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>3.16 Utilities</b>									
<b>Cumulative Impact 3.16-1:</b> Reduced ability to access PG&E towers, stations or electrical transmission lines.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.16-2:</b> Reduced clearance between waterways and PG&E electrical transmission lines.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
<b>Cumulative Impact 3.16-3:</b> Reduced structural integrity of PG&E towers.	PS	LTS	LTS	PS	PS	PS	LTS	LTS	LTS

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.



Table ES-3 Cumulative Impacts Identified in the SBSP Restoration Project EIS/R (Continued)

IMPACT	PROGRAM ALTERNATIVES			PHASE 1 - NO ACTION			PHASE 1 ACTIONS		
	A	B	C	Eden Landing	Alviso	Ravenswood	Eden Landing	Alviso	Ravenswood
<b>Cumulative Impact 3.16-4:</b> Changes in water level, tidal flow and sedimentation near storm drain systems.	PS	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.16-5:</b> Changes in water level, tidal flow and sedimentation near pumping facilities.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.16-6:</b> Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.	LTS	LTS	LTS	No Impact	LTS	No Impact	No Impact	LTS	No Impact
<b>Cumulative Impact 3.16-7:</b> Disrupt Hetch Hetchy Aqueduct Service so as to create a public health hazard or extended service disruption.	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B	LTS, B
<b>Cumulative Impact 3.16-8:</b> Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.16-9:</b> Reduced access to sewer force mains due to levee construction.	LTS	LTS	LTS	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
<b>3.17 Aesthetics</b>									
<b>Cumulative Impact 3.17-1:</b> Alter views of the SBSP Restoration Project Area.	PS	PS	PS	PS	PS	PS	PS	PS	PS
<b>Cumulative Impact 3.17-2:</b> Alter the existing visual character of the Project Area and its surroundings.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

Note: The level of significance identified for the cumulative impacts above reflects the combined effects of implementing the SBSP Restoration Project with other cumulative projects. For example, even if the SBSP Restoration Project would contribute less than significant impacts to overall cumulative effects, if the cumulative effects from other projects would result in potentially significant impacts, then the level of significance would be shown as PS. Cumulative projects, as well as the SBSP Restoration Project's contribution to cumulative impacts, are discussed in Chapter 4, Cumulative Impacts.

## S.6 Environmentally Preferred/Superior Alternative

The Environmentally Preferred Alternative is defined by CEQ as the alternative that best meets the criteria of Section 101(b) of NEPA (42 United States Code [USC] 4331)<sup>4</sup>. CEQA Guidelines Section 15126.6 addresses the selection of the Environmentally Superior Alternative among the alternatives proposed.

Alternative A would result in potentially significant impacts in issue areas including hydrology and flood management; surface water, sediment, and groundwater quality; biological resources; and recreation and public access. No mitigation measures to reduce potential impacts to less-than-significant levels are identified for the No Action Alternative. USFWS would specifically focus on its mission to conserve fish, wildlife, and plant resources and their habitats in accordance with the National Wildlife Refuge System Administration Act of 1966<sup>5</sup> and the National Wildlife Refuge System Improvement Act of 1997<sup>6</sup>. While USFWS and CDFG (the landowners) would continue to operate and maintain the ponds in a manner similar to the ISP (and Pond A6) with available funding under the No Action Alternative (*e.g.*, maintain habitat for endangered species and maintain a minimum level of flood protection), there is no guarantee that the landowners would be able to take the appropriate actions to ensure that impacts would be reduced to less-than-significant levels. Consequently, the potential significant impacts identified for the No Action Alternative are considered to be significant and unavoidable. In addition, none of the benefits proposed under Alternatives B and C would occur.

The significant impacts that would occur under Alternative A would not occur under Alternatives B and C because the Adaptive Management Plan, as an integral component of both Alternatives B and C, and design elements would be implemented to avoid such effects. Management responses would be implemented based on ongoing monitoring and applied studies. In the absence of monitoring and adaptive management, many of the impacts identified for Alternatives B and C would be potentially significant. Additionally, Alternatives B and C would provide benefits (*e.g.*, flood protection and habitat for specific wildlife species). However, if adaptive management measures are not successful in averting significant impacts, that would be a basis for “exiting” the adaptive management staircase and stopping project implementation somewhere between Alternatives B and C.

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<sup>4</sup> The environmentally preferred alternative is the alternative that will promote the national environmental policy expressed in NEPA (Sec. 101 (b)), as follows:

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

<sup>5</sup> 16 USC 668dd-668ee, as amended.

<sup>6</sup> P.L. 105-57



Alternatives B and C would result in more construction-related impacts than Alternative A and these impacts are not addressed in the Adaptive Management Plan. However, construction impacts would be temporary and can be reduced to less-than-significant levels by implementing the mitigation measures identified in this EIS/R (refer to Table ES-2).

Alternatives B and C are environmentally superior to Alternative A based on:

- The number of significant and unavoidable environmental impacts under Alternative A;
- The adaptive management approach and design elements that would avoid significant environmental impacts under Alternatives B and C; and
- Mitigation measures that would reduce temporary construction impacts to less-than-significant levels under Alternatives B and C.

NEPA requires the selection of a preferred alternative. Although the ultimate configuration would be somewhere between Alternatives B and C, to satisfy NEPA requirements, Alternative C has been identified as the preferred alternative at this time. Alternative C is the preferred alternative because its habitat mosaic most closely represents the historic pre-salt-pond landscape (*i.e.*, greatest area of tidal marsh). Pursuant to the Project's adaptive management approach, Alternative B would equally achieve the Project Objectives, and would be achieved first. However, there is not enough knowledge and insight about the processes at work or the cause-and-effect relationships to determine the optimal mix of tidal habitat and managed ponds at this time. The ultimate configuration of tidal habitat and managed ponds in the Project Area would be determined through adaptive management and would likely fall somewhere between Alternatives B and C, the "bookends". As such, the Adaptive Management Plan would allow the SBSP Restoration Project to move forward and respond to this uncertainty.

As described above, the Project's approach is to take the lessons learned from each phase of the SBSP Restoration Project and inform future phases and determine the ultimate outcome. That outcome (which would fall between the 50:50 and 90:10 tidal habitat : managed ponds scenarios) would be the endpoint which achieves the maximum amount of tidal restoration possible without causing significant adverse effects on environmental resources. The Adaptive Management Plan would guide the Project to an outcome that is the ultimate configuration of the ponds in the Project.

Similarly, regarding public access and recreation, even though Alternative C is designated as the preferred alternative, the ultimate configuration of public access features in the Project Area would be determined through adaptive management. The ultimate configuration would likely be some combination of the features included in Alternatives B and C that represents the appropriate degree of public access compatible with the habitat configuration. Again, the Adaptive Management Plan would allow the SBSP Restoration Project to move forward and respond to this uncertainty.

## S.7 Areas of Controversy

CEQ Regulations for Implementing NEPA (40 CFR 1502.12) and Section 15123 of the CEQA Guidelines require that an EIS/R identify areas of controversy. The following issues have been raised by the SBSP Restoration Project Stakeholder Forum, the public and/or agencies as being of the greatest concern:

- Potential effects on mercury bioaccumulation in the South Bay;
- Trade-offs between habitat restoration and public access/recreation opportunities;
- Trade-offs between tidal and managed pond species;
- Provision of flood protection as a prerequisite for tidal restoration in many areas;
- Availability of funding for implementation of the Adaptive Management Plan (monitoring); and
- The potential entrainment of salmonids and estuarine fish in managed ponds, including tidally muted Pond A8.

## S.8 Issues to be Resolved

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

The Adaptive Management Plan proposes applied studies to resolve the following key uncertainties:

- Is there sufficient sediment available in the South Bay to support marsh development without causing unacceptable impacts to existing intertidal habitats?
- Can the existing number and diversity of migratory and breeding shorebirds and waterfowl be supported in a changing (reduced salt pond) habitat area?
- Can restoration actions be configured to maximize benefits to non-avian species both onsite and in adjacent waterways?
- Will mercury be mobilized into the food web of the South Bay and beyond at a greater rate than prior to restoration?
- Can invasive and nuisance species such as *Spartina alterniflora* (or the invasive *Spartina* hybrid), corvids and the California gull be controlled? If not, how can the impacts of these species be reduced in future phases of the Project?
- Will restoration adversely affect water quality and productivity (food web dynamics)?



- Will trails and other public access features/activities have significant negative effects on wildlife species?
- How will the Project gain support from the public now and into the future, including support for continued funding of restoration and management?

Questions concerning the effectiveness and cost/benefit trade-offs of particular restoration design elements or management approaches would be addressed through examination of specific restoration techniques in Phase 1.

In summary, the SBSP Restoration Project is an ambitious effort to restore thousands of acres of habitat around the South Bay shoreline while providing for flood protection and public access. This EIS/R discloses the potential impacts and benefits of the restoration, and describes the programmatic approach and its integral Adaptive Management Plan and the project-level Phase 1 actions.