PHASE 2 SCOPING CHARRETTE REPORT

This page intentionally left blank

South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

Phase 2: Preliminary Options for Future Actions

SBSP Project Management Team

September 2010

Table of Contents

Section **Page**

II. Proposed Timeline 6

III. Evaluation Criteria 7

IV. Phase 2 Options 9

A. Ravenswood Complex Actions 9
B. Eden Landing Complex 12
C. Alviso Complex 16

V. Project Evaluation Matrix 21

VI. Applied Studies 25

PHASE 2 DESIGN IDEAS
PROJECT MANAGEMENT TEAM WORKING DRAFT
25 August 2010

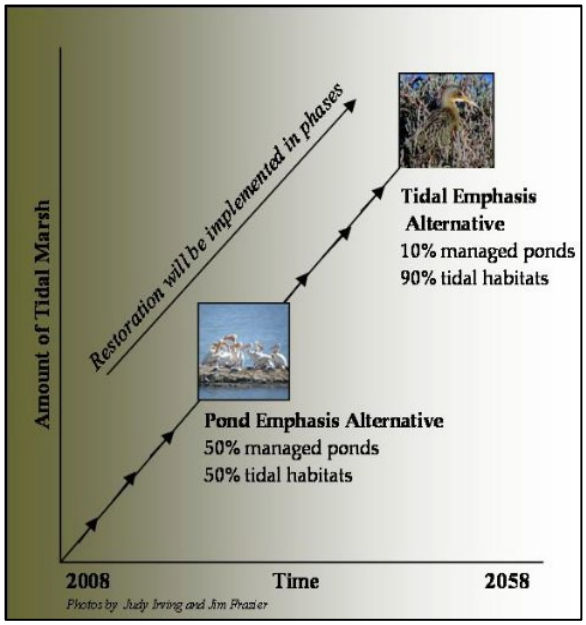
1. INTRODUCTION

The purpose of this brief report is to brief interested parties on the preliminary actions identified by the Project Management Team regarding the next phase of restoration and solicit input on these (and other) alternatives. The Project Management Team held a preliminary design charrette brainstorming workshop on May 13, 2010, and have refined their ideas in subsequent meetings through the summer. This document will serve as the baseline for an open dialogue with the stakeholders regarding Phase 2 of the Project.

The South Bay Salt Pond Restoration Project (Project) has three project goals:

- Wetland habitat enhancement and restoration
- Improved flood management
- Improved public access and recreation

These goals will be achieved as the Project is implemented in phases along an Adaptive Management continuum (see Figure 1 below). Adaptive Management is an integral part of the Project, allowing for lessons learned in earlier phases to be incorporated into subsequent phases as future restoration actions are formulated. Phase 1 Actions are currently underway, and the ultimate project configuration will be between the two "bookends" for the Project established in the EIS/R: a minimum of 50% tidal restoration to a maximum of 90% tidal restoration. Future phases of the Project will continue to fulfill the mission of the Project by integrating habitat restoration with flood management and wildlife-compatible public access.



Actions subsequent to Phase 1 will be based, in part, on the evaluation of adaptive management information collected in previous phases. For example, information collected in Phase 1 from monitoring and applied studies on bird response to pond management, methyl mercury, and public access- wildlife interactions will be instrumental in determining the extent and location of future tidal restoration and public access features. Future tidal restoration is also dependent upon the provision of flood management

(either maintaining or improving existing flood protection levels). Additionally, public access actions will be included in future phases, either independent of, or in close coordination with, habitat restoration and flood management actions.

Guiding Principles

The overarching guiding principles for the selection of Phase 2 actions will be to first "do no harm" relative to flood impacts, and second to progress toward the 50:50 managed pond-tidal marsh "bookend" as outlined in the EIS/R. Collectively, these guiding principles mean that we are not able to take certain actions until adequate flood management levees are in place, and that ponds proposed to be managed ponds under the 50:50 scenario but tidal marsh under the 90:10 scenario will not be returned to tidal action as part of Phase 2. Until adaptive management results supply us with significant data to the contrary, the Project should adhere to the decisions made in previous planning processes.

Precedent Actions

Actions specific to any one of the three project goals of habitat restoration, flood management and public access may be dependent upon precedent actions. For example, many flood management actions proposed as part of the Project, such as levee construction, may wait for completion of the WRDA-authorized South San Francisco Bay Shoreline Study. However, the Shoreline Study is not expected to be complete for several years.

Evaluation Criteria

Phase 2 of the South Bay Salt Pond Restoration Project will take into consideration a number of evaluation criteria. Many of the criteria will be the same as those used in developing Phase 1 actions. Other criteria will be based on the results of Applied Studies and monitoring. Application of the criteria below, along with consideration of essential flood management actions and the layering of additional public access actions, will make implementation of future actions a varied mixture of habitat restoration, flood management, and public access activities occurring on unique schedules based on development of actions and associated design, funding and construction schedules.

Examples of this varied mix of Phase 2 actions could include:

- The construction of a flood management levee,
- Development of an additional viewing area,
- Tidal restoration of a pond on the bayside of the flood levee,
- Refinement of a Phase 1 Applied Study.

These actions will likely occur according to different time schedules, and in different pond complexes.

Alternatively, public access projects, such as completion of some Bay Trail spine segments, can proceed independently of changes in habitat. Many Bay Trail spine segments can and will be built (when funds are available) on existing or temporary levees that are ultimately proposed to be replaced with well-engineered flood protection levees.

However, the Project must be careful to avoid taking actions in Phase 2 that may impede restoration actions in subsequent phases. (Examples of such actions include breaching inboard ponds leaving bayside ponds more difficult to access, or providing public access in areas that may become tidal in the future and where public access and long-term operations and maintenance are not desired.)

II. PROPOSED TIMELINE

A preliminary draft timeline of the Phase 2 planning process is outlined below.

Phase 2 Action	2010				2011				2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Design Charrette																
Specific Pond Complex Evaluations																
Stakeholder Meetings																
Release RFP																
Preliminary Design																
Environmental Review (NEPA/CEQA)																
Adaptive Management Input																
Regulatory Permitting																
Secure Funding																
Construction Documents																
Begin New Applied Studies																
Begin Construction																☼

III. EVALUATION CRITERIA

During the Phase 2 design charrette on 13 May 2010, the Project Management Team reviewed and revised the considerations used in selecting the set of Phase 1 actions. These criteria were adapted and expanded to include additional relevant criteria to be used in selecting the Phase 2 actions. These Evaluation Criteria, and the discussion that follows of potential preliminary range of options for Phase 2, are intended to be a starting point to engage the public and key stakeholders in an open dialogue regarding the next step in this important project.

Primary Evaluation Criteria

Likelihood of progress toward Project Objectives

- (Now) Will the action produce a significant habitat, flood management, or public access benefit?
- (Future) Will the action now lead toward greater success in later phases (e.g., current actions facilitate future acreage for restoration)?

Considerations:

- Are relevant Adaptive Management findings available? If so, are these findings incorporated into the proposed action?
- Is there any new relevant information that was not available during earlier planning that is now available and should be considered in planning this action?

Opportunities for adaptive management

- What high priority studies can we implement to answer key questions/ uncertainties not currently being addressed?

Considerations:

- How does the proposed action contribute to evaluating the risks and benefits of adaptive management actions?

Value in continuing to build Project support

- Does the Phase 2 action continue to build support for the project geographically (by complex or landowner), regionally, or for specific user groups?

Readiness to proceed

- If the proposed action were a standalone action, would it be likely to be permitted in a timely manner (within 5 years)?
- Ease of implementation and success. Is the project technically feasible? Are there significant constraints to designing and constructing the proposed action?
- Could construction commence in a timely manner (within 3 years of receipt of permits)?

Dependency on precedent actions

- Are there pre-requisites to implementing a particular action (e.g., flood management levee) that will not be completed within the Phase 2 timeframe, either by the SBSP project or by others? (See Guiding Principles section.)

Secondary Criteria

Visibility and accessibility

- Will the results be visible to the public and/or decision makers?
- Will the results be accessible to the public and/or decision makers?

Considerations:

- If other on-going or planned projects are nearby, how is the proposed action integrated with these projects?
- *Note:* Public access may be accomplished independent of the restoration and flood management aspects of the Project.

Balance (considered for the suite of Phase 2 actions)

- Does the slate of proposed actions represent an appropriate balance between the three project goals of habitat restoration, flood management, and public access?
- Is this balance evident within one complex, or across the entire Project Area?
- Does the action contribute to maintaining a balance between the two landowners (USFWS and CDFG)?
- Are the Phase 2 actions distributed throughout the Project Area, taking onto account the locations of the Phase 1 actions?

Availability of funding

- What is the amount of funding needed to carry out the action (planning, implementation, O&M, monitoring, Applied Studies)?
- What costs, if any, may be avoided by carrying out the proposed action?
- Is the level of funding needed for the entire project likely to be available?
- What are the funding sources, how secure are the funds and what restrictions might they apply?

IV. PHASE 2 OPTIONS

Using the guiding principles and evaluation criteria outlined above, the Project Management Team went through each complex at the 13 May 2010 Phase 2 design charrette and subsequent meetings to formulate the potential actions for the next phase of restoration.

As part of the charrette process, the Project Management Team also identified several Project-wide actions that warrant consideration for Phase 2. These are described below followed by sections outlining potential Phase 2 actions by pond complex.

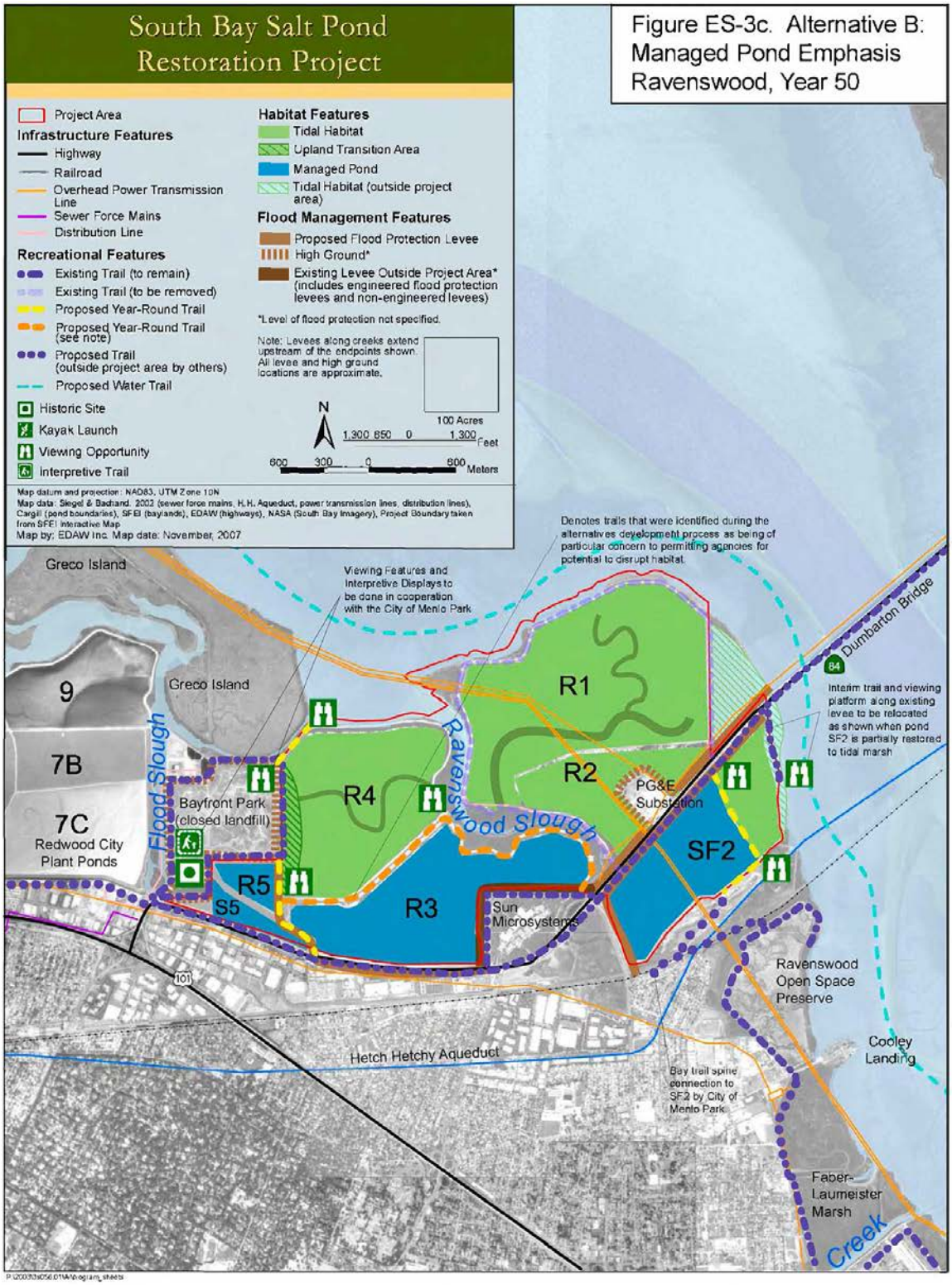
Overall next steps include discussions with key stakeholders, regulatory agencies, and the public and a subsequent refinement of the Project options.

A. Ravenswood Complex Actions

Below are the preliminary ideas discussed at the Phase 2 design charrette for the Ravenswood Complex. A major constraint to additional tidal restoration at this complex is the flood management issue along Highway 84. Next steps to address flood management improvements at Ravenswood include setting up a meeting to discuss these issues with the City of Menlo Park, Caltrans, and PG&E. These discussions should begin in 2010 in order to be resolved by Phase 3.

Table 1. Ravenswood Complex Phase 2 Options.

#	Restoration Action	Flood Management	Habitat Created	Public Access Opportunity	Key Uncertainties/ Questions
1	R4 Tidal Restoration	Requires raised levee between R4 & R3	▪ Tidal marsh ▪ Planned upland transition on west side ▪ Impact to nesting western snowy plovers, small shorebirds using R4	▪ R4 spur trail near Greco ▪ Hunting/ fishing may be possible ▪ Temporary trail along new R3/R4 levee?	▪ Place to store fill ▪ Bayfront Park solid waste exposed to tidal action ▪ Impact on future tidal restoration at R3 ▪ Inboard R4 levee versus internal levee between R3/R4 ▪ Caspian tern island in R3? (R3/R4 levee needed) ▪ Better to restore R3/R4 as 1 block?
2	R5/S5 managed ponds	Levee from 84 to Bayfront Park	Uncertain which species to manage these ponds for at this time.	Trail from highway to Bayfront Park	
3	R1/R4/R2 seasonal + re-plumb R3/S5/R5	Internal levee (non-flood management) between R3 and R4	Allows better pond management for maximizing waterbird habitat		▪ Requires water control structures for R2 & R3 ▪ R1/R2 without levee floods 84 & PG&E substation
4	New water control structures at R ponds		Allows better pond management for maximizing waterbird habitat	Hunting may be possible	


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
Historic Site
Kayak Launch
Viewing Opportunity
Interpretive 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.
N
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: November, 2007
Denotes trails that were identified during the alternatives development process as being of particular concern to permitting agencies for potential to disrupt habitat.
Viewing Features and Interpretive Displays to be done in cooperation with the City of Menlo Park
Greco Island
Greco Island
9
7B
7C
Redwood City Plant Ponds
Flood Slough
Bayfront Park (closed landfill)
S5
R5
R4
R3
R1
R2
SF2
Ravenswood Slough
PG&E Substation
Sun Microsystems
Dumbarton Bridge
84
Interim trail and viewing platform along existing levee to be relocated as shown when pond SF2 is partially restored to tidal marsh
101
Hetch Hetchy Aqueduct
Ravenswood Open Space Preserve
Cooley Landing
Bay trail spine connection to SF2 by City of Menlo Park
Faber-Laumeister Marsh
Creek

B. Eden Landing Complex

Below are the preliminary ideas discussed at the Phase 2 design charrette for the Eden Landing Complex. The general consensus of the PMT is that some form of tidal restoration in the southern half of the complex (between Old Alameda Creek and the Alameda Flood Control Channel) is the logical Phase 2 action. However, there are many options (see Table 2) for possible configurations of tidal restoration. Close coordination with the Alameda County Flood Control District is required to determine what actions can be taken prior to the construction of major flood management levees. In addition, careful consideration must be given to the existing water management regime and infrastructure to ensure that ponds not restored in Phase 2 can meet water management goals.

In addition, detailed designs for public access and recreation will involve close coordination and joint development with the East Bay Regional Park District to ensure expansion of trail options that to the extent possible meet the needs of the Project, the Department of Fish and Game (the landowner) and the District.

An Eden Landing working group has been initiated with the County and the Park District. Regular meetings will be established to closely coordinate on the necessary phasing of flood management and restoration actions. Next steps include involving other key stakeholders such as the Hayward Area Shoreline Planning Agency in the planning process. In addition, Cargill has been contacted to discuss options pertaining to the properties they have retained (Turk Island, “Cal” Hill and adjacent Pond E3C) in the southern Eden Landing area.

Table 2. Eden Landing Complex Phase 2 Options

#	Restoration Action	Flood Management	Habitat Created	Public Access Opportunity	Key Uncertainties/ Questions
1	E2 Tidal Restoration	New E1/E2 and E4/E7 levee improvements required.	▪ Tidal marsh including fish nursery habitat	▪ Spur trail along E6 on south side of Old Alameda Creek to Alvarado Salt Works (bridge will be needed if E6 becomes tidal in the future)	▪ Cargill mitigation pond (adjacent to E1) is example of how E pond restoration may respond ▪ E2-only option allows for continued inboard WQ mgmt through E1 intake.
2	E2 & E4 Tidal	New E1/E2 and E4/E7 levee improvements required.	▪ Tidal marsh including fish nursery habitat		▪ More separate pond intakes and outlets – desirable for operation but costly.
3	E5/E6/E6C Tidal	▪ G-1 levee along E5/E6 ▪ Add'l E6C inboard levee improvements ▪ E5/E4/E7 levee improvement required	▪ Tidal marsh including fish nursery habitat ▪ Upland transition habitat possible	EBRPD Bay Trail along new inboard flood management levee	▪ E12/E13 may inform what type of managed ponds are desirable at E5/E6 ▪ May increase scour along Old Alameda Creek
4	E1/E7 Tidal	Levee improvements in remaining ponds required, incl. E1-E2, E7- E2, E7-E4, E5-E7, E6-E7	▪ Tidal marsh including fish nursery habitat	▪ Spur trail along E6 on south side of Old Alameda Creek to Alvarado Salt Works	▪ Requires new intake in E6 to operate E2 pond system operation
5	E1/E2/E4/E7 Tidal	Levee improvements required to isolate E6-E5- E6C	▪ Tidal marsh including fish nursery habitat	▪ Spur trail along E6 on south side of Old Alameda Creek to Alvarado Salt Works	▪ Requires new E6 intake to operate remaining E6-E5-E6C pond system

Table 2. Eden Landing Complex Phase 2 Options

#	Restoration Action	Flood Management	Habitat Created	Public Access Opportunity	Key Uncertainties/ Questions
6	E1-7 + E6C Tidal	▪ G-1 levee along E5/E6 ▪ Add'l E6C inboard levee	▪ Tidal marsh including fish nursery habitat ▪ Upland Transition habitat possible		▪ E2C intake structure would require fish screen, new water control structure for E1C, E5C, E4C or operations budget for "Cal" Hill intake to E1C would be needed unless they remain seasonal (summer dry)
7	Eel Grass Subtidal Habitat (off E2)		▪ Fisheries		Review status of planned projects off of Eden Landing
8	G-1 pilot levee (adjacent to Ponds E6 and E5)	Pilot flood management levee project	▪ Upland transition habitat possible	EBRPD Bay Trail along inboard levee	▪ Needs to be coupled with wetland restoration
9	Managed pond improvements at E8, E6A and E6B		▪ Duck habitat in winter, nesting plover/shore- bird habitat in spring and summer		▪ New pumps required; need to assess the feasibility of this management possibility and identify long-term funding beyond Phase 2 timeline.

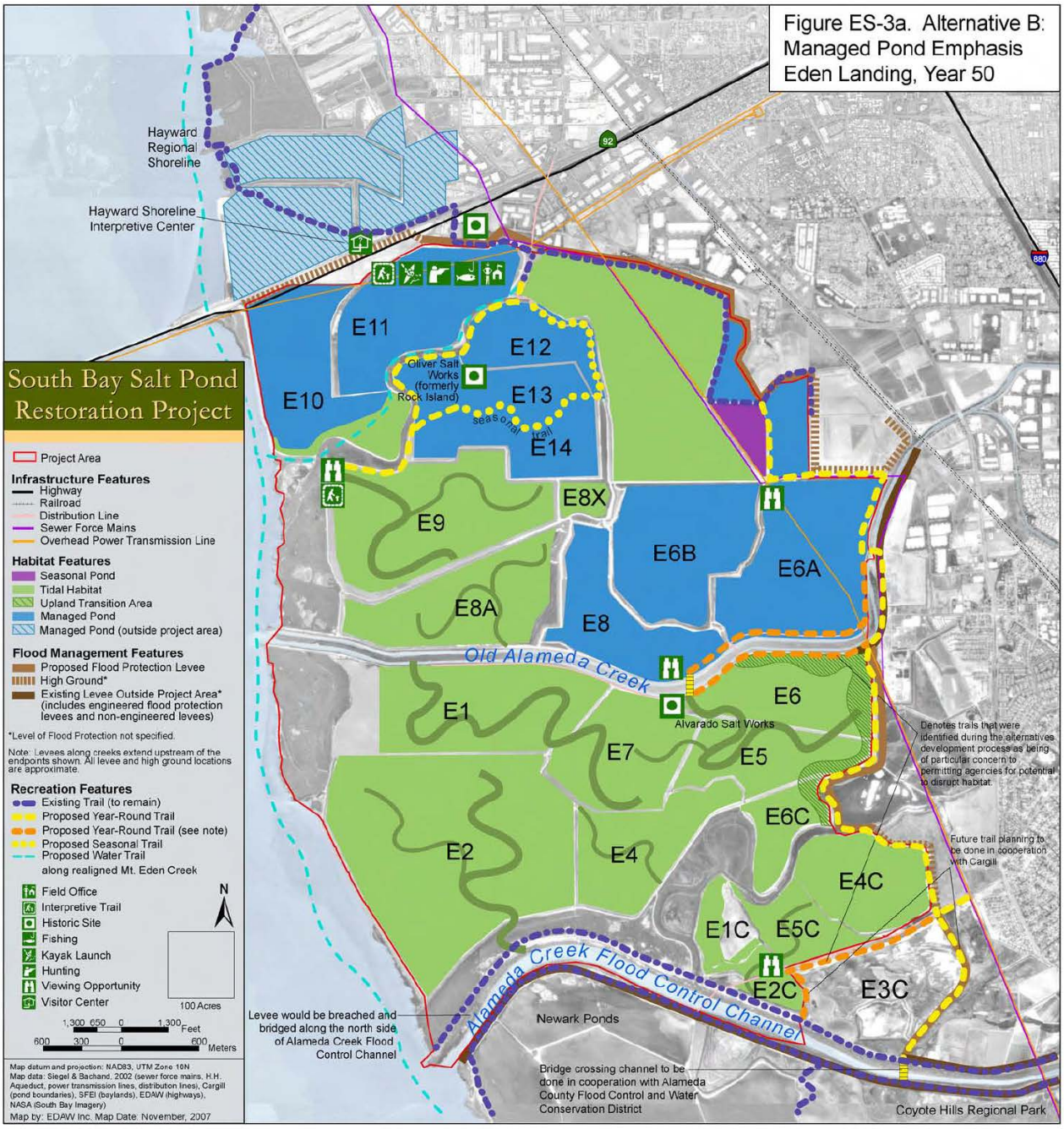


Figure ES-3a. Alternative B: Managed Pond Emphasis Eden Landing, Year 50
Hayward Regional Shoreline
Hayward Shoreline Interpretive Center
92
880
E11
E12
E10
E13
E14
Oliver Salt Works (formerly Rock Island)
seasonal trail
E9
E8X
E6B
E6A
E8A
E8
Old Alameda Creek
E1
E6
Alvarado Salt Works
E7
E5
E6C
E2
E4
E4C
E1C
E5C
E2C
E3C
Alameda Creek Flood Control Channel
Newark Ponds
Levee would be breached and bridged along the north side of Alameda Creek Flood Control Channel
Bridge crossing channel to be done in cooperation with Alameda County Flood Control and Water Conservation District
Coyote Hills Regional Park
Denotes trails that were identified during the alternatives development process as being of particular concern to permitting agencies for potential to disrupt habitat.
Future trail planning to be done in cooperation with Cargill
South Bay Salt Pond Restoration Project
Project Area
Infrastructure Features
Highway
Railroad
Distribution Line
Sewer Force Mains
Overhead Power Transmission Line
Habitat Features
Seasonal Pond
Tidal Habitat
Upland Transition Area
Managed Pond
Managed Pond (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.
Recreation Features
Existing Trail (to remain)
Proposed Year-Round Trail
Proposed Year-Round Trail (see note)
Proposed Seasonal Trail
Proposed Water Trail along realigned Mt. Eden Creek
Field Office
Interpretive Trail
Historic Site
Fishing
Kayak Launch
Hunting
Viewing Opportunity
Visitor Center
N
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)
Map by: EDAW Inc. Map Date: November, 2007
P:\2093\3a056.01\Ai\program_sheets

C. Alviso Complex

Below are the preliminary ideas discussed at the Phase 2 design charrette for the Alviso Complex. A major constraint to additional tidal restoration at this complex is the need for flood management for large areas of Santa Clara County. Next steps to address flood management improvements at Alviso are largely dependent upon the South San Francisco Bay Shoreline Study (Shoreline Study).

The Shoreline Study is a Congressionally-authorized study being performed by the US Army Corps of Engineers together with the Santa Clara Valley Water District and State Coastal Conservancy to identify and recommend for Federal funding one or more projects for flood damage reduction, ecosystem restoration and related purposes such as public access.

Also, mercury continues to be a significant issue for the Alviso complex, and any tidal restoration planned in advance of the Applied Study results, including current Phase 1 actions, will continue to be carefully selected to avoid additional exposure risks.

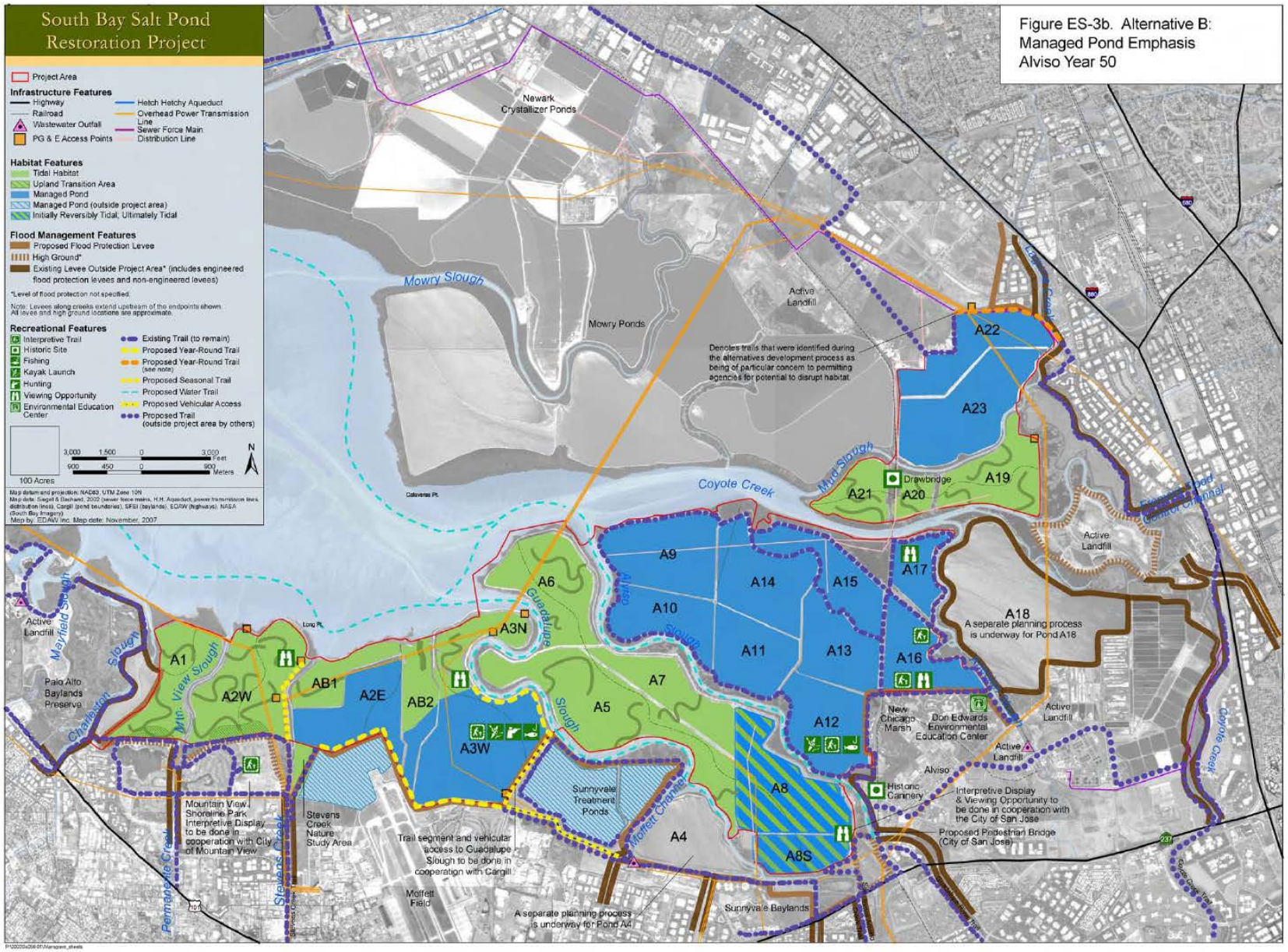
Table 3. Alviso Complex Phase 2 Options

	#	Optimal Restoration	Flood Management	Habitat Modified	Public Access Opportunity	Key Uncertainties/ Questions
Without Corps Levees	1	A1 tidal	Is A1/Charleston Slough levee needed?	Tie into existing restoration projects? Upland transition habitat possible.	Improved access to marsh on existing trail	▪ Landfill liner ▪ Possible preservation of islands within pond for tern colony
	2	A1 & A2W tidal		Habitat used by dabbling and diving ducks -- potential loss. Upland transition habitat possible.	Bay Trail enhancement	▪ If marsh, move trail on southern end of A2W? ▪ PG&E ▪ Fluvial tie-in for flooding ▪ Landfill liner
	3	Breach Island Ponds on mud slough	May need levee to protect north (A22/A23)		Water Trail access to marsh on Mud Slough	Feasibility study of benefits needed?
	4	A2W tidal		Future Upland transition habitat possible.	Bay Trail enhancement	
	5	A3W Seasonal Trail				
	6	A3W Managed Pond Enhancement				▪ Applied Study on pond management and algae/DO issues?

Table 3. Alviso Complex Phase 2 Options

	#	Optimal Restoration	Flood Manage ment	Habitat Modified	Public Access Opportunity	Key Uncertainties/ Questions
With Levee 'Enhancement' Only	7	A3N tidal	Inland levee needed			▪ PG&E
With Corps Levees*	8	A9/10/11/14 fully tidal			Loss of A9 loop	▪ Need to find managed ponds elsewhere?
	9	Levee Stevens Creek to Sunnyvale west with restoration				
	10	Alviso levee and restore Ponds A9/10/11/12/13/14/ 15				▪ Railroad has to be raised to build Alviso levee
	11	A23 tidal				

*These are not under consideration for Phase 2 due to the likely timing of Corps flood management levee construction.


South Bay Salt Pond Restoration Project
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
N
Map datum and projection: NAD83, UTM Zone 10N
Map date: 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
Figure ES-3b. Alternative B: Managed Pond Emphasis Alviso Year 50
Newark Crystallizer Ponds
Mowry Slough
Mowry Ponds
Active Landfill
Denotes trails that were identified during the alternatives development process as being of particular concern to permitting agencies for potential to disrupt habitat.
A22
A23
A19
A21
A20
Drawbridge
Mud Slough
Coyote Creek
Calaveras Pt.
Long Pt.
A9
A14
A15
A17
A10
A11
A13
A16
A18
A separate planning process is underway for Pond A18
A6
A3N
Guadalupe Slough
Alviso Slough
A7
A5
A1
A2W
AB1
A2E
AB2
A3W
A12
A8
A8S
A4
Active Landfill
Mayfield Slough
Charleston Slough
Mtn View Slough
Palo Alto Baylands Preserve
New Chicago Marsh
Don Edwards Environmental Education Center
Alviso
Historic Cannery
Interpretive Display & Viewing Opportunity to be done in cooperation with the City of San Jose
Proposed Pedestrian Bridge (City of San Jose)
Sunnyvale Treatment Ponds
Moffett Channel
Mountain View Shoreline Park Interpretive Display to be done in cooperation with City of Mountain View
Stevens Creek Nature Study Area
Trail segment and vehicular access to Guadalupe Slough to be done in cooperation with Cargill
Moffett Field
A separate planning process is underway for Pond A4
Sunnyvale Baylands
Permanente Creek
Stevens Creek
Coyote Creek
Lower Coyote Creek
Flood Control Channel
P:\20020\x006 01\Managed_alt.eps

Project-wide Actions

Project-wide actions are those that the PMT felt were important to consider in Phase 2, but were not specific to an individual pond complex at this time. Upon further development, they may be focused on a specific geographic region, but for now are being considered at a landscape-scale.

Beneficial re-use of dredged material.

Get approval to opportunistically receive dredge material in 3-5 locations (matching the upland transition zones areas if possible) throughout the Project area.

Rationale: In light of sea-level rise, existing subsided ponds, potential reduction in suspended sediment concentrations in the Bay, and proposed broad upland transition zones, the Project can utilize as much sediment as possible. Since the inception of the Project, opportunities have arisen where unplanned sources of material were available. The Project is proposing to pursue approvals to receive material at various locations within the Project footprint as they become available. This will allow the Project to capitalize on sediment as it becomes available. Ideally these materials will be used to expedite marsh development, fill borrow ditches, and create broad upland transition zones. Applied Studies evaluating characteristics (such as contaminants) and placement of dredge materials would greatly inform future management actions.

Subtidal Habitat Goals pilot projects.

Pilot project(s) and/or studies at any of the complexes relative to the Subtidal Goals Project (e.g., eelgrass, oyster, living shoreline projects).

Rationale: The Draft Subtidal Habitat Goals Report is currently out for public review and will be finalized during the Phase 2 planning process. The long-term vision for the restoration of the South Bay by the PMT, Science Team, National Science Panel and Stakeholders Forum for the South Bay Salt Pond Restoration Project has always included subtidal habitat enhancements as part of the long-term vision. Numerous opportunities exist to further the goals of both projects through Applied Studies or pilot projects as part of Phase 2.

Public access and recreation study.

Continue to study user needs/wants for new public access and recreation features associated with the project.

Rationale: Public access and recreation is one of the three goals of the Project. However, planning for public use has been largely focused on site specific opportunities. The PMT will make a comprehensive evaluation of the needs and desires of the public in terms of public access and recreation is needed to help guide future phases of the Project to make sure that we are meeting the needs of the likely users.

V. PROJECT EVALUATION MATRIX

Potential Phase 2 options are laid out in the matrix below (Table 4) that takes into account the revised Phase 2 evaluation criteria described earlier in the report (see Section II, page 7). The purpose of the evaluation matrix below is to illustrate the Project Managers' initial assessment of each Phase 2 option, using the selection criteria described earlier. These criteria include:

- *Likelihood of progress toward Project Objectives*
- *Opportunities for adaptive management*
- *Readiness to proceed*
- *Visibility and accessibility*
- *Balance*
- *Availability of funding*
- *Value in continuing to build Project support**
- *Dependency on precedent actions**

Note: In general, actions that require a major precedent action, e.g. construction of a flood management levee, are not being considered in Phase 2. For that reason "dependency on precedent action" is not included in the matrix. In addition to "Value in continuing to build Project support," the "Visibility and Accessibility" criterion was also used as a proxy for assessing an action's overall value in continuing to develop public support for the Project

Table 4. Project evaluation Matrix for Phase 2 Actions.

(Ranking Convention: ○=Low, ●=Medium, ●=High)

Restoration Action	Balance						Flood Protection Level[3]	Progress Toward Objectives[4]	Readiness to Proceed[5]	Value to the Project: Visibility and Accessibility[6]	Priority for Applied Study? (Y/N)[7]	Cost[8]
	Type[1]			Pond Complex[2]								
Beneficial re-use of dredged material	hr	fm		A	E	R	●	●	●	○	Y (1)	●
Subtidal Habitat Goals pilot projects	hr			A	E	R	●	●	●	○	Y (3)	●
Public access and recreation study			pa	A	E	R	●	●	○	○	Y (4)	●
R4 Tidal Restoration	hr					R	●	●	●	●	Y (5,7)	●
R5/S5 managed ponds	hr					R	●	●	●	●	N	●
R1/R4/R2 seasonal + re-plumb R3/S5/R5	hr					R	●	○	●	○	N	●
New water control structures at R ponds	hr					R	●	○	●	○	N	●
R4 spur trail			pa			R	●	●	●	●	Y (4,7)	●
Trail between Hwy and Bayfront Park			pa			R	●	●	●	●	Y (4,7)	●
E2 Tidal Restoration	hr	fm			E		●	●	●	●	Y (3, 9, 10)	●

Table 4. Project evaluation Matrix for Phase 2 Actions.

(Ranking Convention: ○=Low, ●=Medium, ●=High)

Restoration Action	Balance						Flood Protection Level[3]	Progress Toward Objectives[4]	Readiness to Proceed[5]	Value to the Project: Visibility and Accessibility[6]	Priority for Applied Study? (Y/N)[7]	Cost[8]
	Type[1]			Pond Complex[2]								
E2/E4 Tidal Restoration	hr	fm			E		●	●	●	●	Y (3, 9, 10)	●
E5/E6/E6C Tidal Restoration	hr				E		○	●	●	●	Y (3, 5, 10)	○
E1/E7 Tidal Restoration	hr				E		●	●	●	●	Y (3, 9, 10)	●
E2/E4 + E1/E7 Tidal Restoration	hr				E		●	●	●	●	Y (3, 9, 10)	●
E1-6 + E6C Tidal Restoration	hr				E		○	●	●	●	Y (3, 5, 10)	○
Eel Grass Subtidal Habitat	hr				E		●	●	●	○	Y (3)	●
G-1 levee		fm			E		●	●	●	●	Y (5, 7)	○
Spur trail along E6 & E7 to Alvarado salt works			pa		E		●	●	●	●	N	●
EBRPD Bay Trail along inboard G-1 levee			pa		E		○	●	●	●	Y (7)	●

Table 4. Project evaluation Matrix for Phase 2 Actions.

(Ranking Convention: ○=Low, ●=Medium, ●=High)

Restoration Action	Balance						Flood Protection Level[3]	Progress Toward Objectives[4]	Readiness to Proceed[5]	Value to the Project: Visibility and Accessibility[6]	Priority for Applied Study? (Y/N)[7]	Cost[8]
	Type[1]			Pond Complex[2]								
A1 Tidal	hr			A			●	●	●	●	Y (5,7)	●
A1 & A2W Tidal	hr			A			●	●	●	●	Y (5,7)	●
Breach Island Ponds on mud slough	hr			A			●	●	●	●	N	●
A2W Tidal	hr			A			●	●	●	●	Y (5,7)	●
A3W Seasonal Trail			pa	A			●	●	●	●	N	●
A3W Managed Pond Enhancement	hr			A			●	●	●	○	N	●
A3N Tidal	hr			A			●	●	●	●	N	●

Key:

[1]hr=habitat restoration, fm=flood management, pa=public access or recreation

[2]A=Alviso, E=Eden Landing, R=Ravenswood

[3]Flood Protection Criterion:

- ○: FEMA flood management levee required
- ●: Able to proceed without FEMA levee
- ●: No flood concerns/improves flood management

[4]Progress Toward Objectives:

- ○: Precludes planned progress to 50-50 Alternative
- ●: Moves to/Equal to 50-50 Alternative
- ●: Moves past 50-50 Alternative toward 90-10

[5]Readiness Criterion:

- ○: Significant precedent actions needed (e.g., FEMA levee)
- ●: Typical constraints (design, regulatory, etc.)
- ●: No impediments to proceeding

[6]Visibility and Accessibility Criterion:

- ○: Neither very visible nor accessible
- ●: Visible, but not accessible, or vice versa
- ●: Both very visible and accessible

[7]See Table 5 below for referenced Applied Study number.

[8]Cost Criterion:

- ○: >$8 million
- ●: $2-8 million
- ●: <$2 million

VI. APPLIED STUDIES

Many of the South Bay Salt Pond Restoration Project actions are specifically designed either to facilitate (or coordinate with Adaptive Management) a specific applied research question, or to respond to the findings of applied research regarding the optimal mix of tidal restoration, pond management, non-levee-dependent flood management and public access and recreation.

Phase 1 of the project includes the implementation of many Applied Studies. All of these studies are designed to provide the Project with important information about the potential for expanding tidal marshes while preserving habitat for pond-dependent species. Several Applied Studies in Phase 1 will also provide information on the effects of increased public access on the wildlife in the ponds and newly restored marshes.

As the Project Management Team developed the options for Phase 2, Project Lead Scientist Laura Valoppi, took the lead in developing concepts for relevant adaptive management Applied Studies that should proceed in Phase 2. The table below illustrates those proposed studies.

Table 5. Potential Phase 2 Applied Study Concepts

Number	Study Idea	All Complexes	Ravenswood	Eden Landing	Alviso
1	Dredge material and sediment plan -- number, sources, types ▪ Feasibility of use of dredge spoils	X			
2	*Spartina* hybrid issue ▪ How much hybridization is okay (genetic question)? ▪ How much invasive *Spartina* is okay before control actions are taken? This requires collaboration with others/ISP.	X			
3	Subtidal pilot project Collaboration with Subtidal Goals Project Eelgrass study/pilot project off E2	X		X	
4	Public access/use surveys/studies ▪ Different communities and user groups, languages ▪ Human disturbance on upland transition zones.	X			
5	Upland transition zones (possibly linked to Number 1 above) ▪ How, where? ▪ How to construct? ▪ How to best construct upland transition zones to maximize benefits to marsh species, especially clapper rail and salt marsh harvest mouse? ▪ Source of materials and stockpiles? ▪ What materials can be used vis-à-vis soil properties/texture? ▪ What contaminant concerns? ▪ Vegetation management: what to seed with? What is native in this habitat? How do we control non-native invasive vegetation on a large scale?	X	X	X	X
6	TAC recommended a long-term "holistic" mercury monitoring program for South Bay Salt Ponds ▪ PMT/TAC to reach consensus on biosentinels ▪ National panel to develop toxicity thresholds	X	X	X	X

Table 5. Potential Phase 2 Applied Study Concepts

Number	Study Idea	All Complexes	Ravenswood	Eden Landing	Alviso
7	What effect will a trail have on a planned transition zone habitat and species use? Could it make species more vulnerable to predation? (Linked to #4 above.) If E6/E5 made tidal first with upland transition habitat and trail adjacent – issue of increased predation or disturbance from trail to upland transition habitat		X	X	
8	Look at SF2 island/habitat for increase in number of snowy plover and shorebirds (re: potential loss of habitat for small shorebirds at R4)		X		
9	Salt pannes -- if they form in E2/E1: and E8A/E9: ▪ How do waterbirds use? ▪ Hg issues since wet/dry cycle? ▪ Muted Mt. Eden Creek pannes -- study those?			X	
10	How does opening/increasing tidal prism in Old Alameda Creek and/or Alameda Flood Control Channel affect fish resources in those channels?			X	
11	If A1/A2W became tidal and displaced dabbling and diving ducks, what effect on Pond A3W and its existing use by ducks? What is the carrying capacity of A3W? What are the effects of hunting within a smaller footprint of ponds?				X