



SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

July 28, 2010

Mr. David Gibson
Executive Officer
SD Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA. 92123-4340

2010 JUL 29 A 10:25

RE: Order No. R9-2009-0038 Amending Order No. R9-2006-0065 (NPDES No. CA0109223) Waste Discharge Requirements for the Poseidon Resources (Channelside) LLC Carlsbad Desalination Project discharge to the Pacific Ocean via the Encina Power Station discharge channel.

Dear Mr. Gibson:

Order R9-2009-0038 ("Order") requires that within 10 months of receiving the Coastal Development Permit ("CDP") for the Carlsbad Desalination Project ("Project"), Poseidon Resources (Channelside) LLC ("Poseidon") must submit to the Regional Water Quality Control Board ("Regional Board") a selected mitigation site and corresponding preliminary restoration plan for Regional Board review and approval. The Coastal Commission issued the CDP for the Project November 3, 2009.

Pursuant to this requirement, Poseidon is submitting the enclosed restoration plan for the Regional Board's review and approval (Attachment 1). Poseidon has selected the Otay River Floodplain within the U.S. Fish and Wildlife Service San Diego Bay National Wildlife Refuge as the proposed location for the mitigation project. The following information is provided in support of this recommendation:

- In August 2008, the California Coastal Commission approved the attached *Marine Life Mitigation Plan* ("MLMP") for the project to provide mitigation for the desalination facility's anticipated entrainment and impingement impacts through creation, enhancement, or restoration of aquatic and wetland habitat, and ensured long-term performance, monitoring, and protection of the approved mitigation measures in a manner consistent with the Coastal Act (Attachment 2).
- The conditions of the MLMP required that Poseidon develop a mitigation plan to restore approximately 66 acres of tidal wetlands to offset project impacts. The MLMP identified 11 potential restoration sites within the southern California bight and provided a mechanism for adding additional sites. Subsequently, the Otay River Floodplain site within the U.S. Fish and Wildlife Service San Diego Bay National Wildlife Refuge was added to the list, bringing the total number of restoration sites under consideration to 12.

Poseidon Resources

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619-595-7802 Fax: 619-595-7892

- On May 9, 2009, the Regional Water Board approved the MLMP as a condition of the Order. The Order provides that restoration opportunities located in San Diego County are to be given priority consideration.
- Poseidon analyzed the feasibility of the 12 southern California restoration sites and ranked them against the minimum standards and the objectives set forth in the MLMP. The attached *Comparison of Selected Southern California Tidal Wetlands as Potential Sites for Mitigation of Impacts Associated with Poseidon Resources Proposed Carlsbad Desalination Plant* provides an evaluation of each of the sites based on a number of factors, including: (1) status of supporting the restoration plans; (2) status of environmental documentation; (3) land ownership; (4) ease of compliance with the MLMP goals and objectives; and (5) likelihood of success (Attachment 3). The Otay River Floodplain site was the only site evaluated that was found to have a high likelihood of success. The Tijuana Estuary site was ranked as having a moderate likelihood of success and the remaining 10 sites were found to have a low likelihood of success.
- U.S. Fish & Wildlife Service (“Service”) has prepared a Comprehensive Conservation Plan (“CCP”) and Environmental Impact Statement to determine the best course of action to enhance, preserve, and manage the San Diego Bay National Wildlife Refuge. A summary of these reports is enclosed (Attachment 4).
- The manager for the San Diego Bay National Wildlife Refuge is in support of a partnership between the Service and Poseidon to facilitate the restoration of Otay River Floodplain consistent with the CCP and thereby providing significant positive impacts on the overall health of the Refuge and develop new habitat that will be beneficial to bird, fish, and plant populations within the Refuge.

In light of the foregoing, Poseidon respectfully submits for the Regional Board’s consideration, at your next available Board meeting, its selection of the Otay River Floodplain as the recommended site for addressing the mitigation requirements described in the Order.

If you have any questions please feel free to contact me at (619) 595-7802.

Sincerely,

A handwritten signature in black ink, appearing to read "Jessica Jones", with a long, sweeping horizontal line extending to the right.

Jessica Jones
Project Manager

Conceptual Restoration Plan for Otay River Floodplain

July 28, 2010



Restoration Site Determination Process

- MLMP Goals and Objectives
- Comparison of Candidate Wetland Sites
- Otay River Floodplain Site
 - Conceptual Restoration Plan
 - Hydrologic Modeling
- Otay River Floodplain Site Compliance with CCC Goals and Objectives
- Recommendation

Marine Life Mitigation Plan (MLMP)

- Restore and enhance up to 66 acres in Southern California Bight
- Two phases
- Tidal wetland with intertidal & subtidal areas
- Provide buffer zone & upland transition area
- Protect against future incompatible land use
- Does not result in a net loss of existing wetlands or impact endangered species.

Candidate Wetland Comparison Report

Wetland	Status of Restoration Plan	Status of Environmental Documentation	Land Ownership	Ease of Compliance with CCC Objectives	Risk to Poseidon	Ranking
Tijuana Estuary	Feasibility Study	Needed	California State Parks	Moderate	Moderate	Moderate
San Diego Bay NWR Otay River Floodplain	Conceptual	Programmatic EIS completed	State Lands Commission	Moderate	Low	High
San Dieguito Lagoon	Conceptual	Needed	San Dieguito JPA	Moderate	*Not Applicable	Low
San Elijo Lagoon	Feasibility Study	Needed	State of California	Difficult	High	Low
Buena Vista Lagoon	Feasibility Study	Needed	State of California	Unknown	High	Low
Aqua Hedionda Lagoon	Not applicable	None	Cabrillo Power-CDFG	Non-compliant	High	Low
Anaheim Bay	CCP (in prep)	None	U.S. Navy	Difficult	High	Low
Santa Ana River	None	None	Private	Unknown	High	Low
Huntington Beach Wetlands (Newland Marsh)	Conceptual	Needed	Caltrans	Moderate	*Not Applicable	Low
Ballona Wetlands	Feasibility Study	Needed	State of California	Moderate	High	Low
Los Cerritos Wetlands	Conceptual Plan	Needed	Acquisition	Difficult	High	Low
Ormond Beach	Pending	Needed	Acquisition	Unknown	High	Low

* These wetlands are not currently available to Poseidon as a potential restoration sites.

NA = Not Available

San Diego Bay National Wildlife Refuge



Phased Restoration of the Salt Ponds

<u>Habitat Acreages</u>	
Intertidal	650 ac.
New nesting areas	36 ac.
Managed water	270 ac.



Salt Marsh Restoration Areas



Existing Condition of Otay River Floodplain Site



Otay River Floodplain Conceptual Restoration Plan – *Alternative 1*



Otay River Floodplain Conceptual Restoration Plan – *Alternative 1*



Hydrologic Modeling

1. Tidal Range...OK
2. Salinity...OK
3. Dissolved Oxygen...OK

Tidal Datums for the 1983-2001 Tidal Epoch

	San Diego Bay Tides: NOAA #941- 0170 Navy Pier	Open Ocean Tides NOAA# 941- 0230 Scripps Pier La Jolla
HIGHEST OBSERVED WATER LEVEL	5.63 ft NGVD	5.35 ft NGVD
MEAN HIGHER HIGH WATER (MHHW)	3.21 ft NGVD	3.03 ft NGVD
MEAN HIGH WATER (MHW)	2.48 ft NGVD	2.30 ft NGVD
MEAN TIDE LEVEL (MTL)	0.45 ft NGVD	0.46 ft NGVD
MEAN LOW WATER (MLW)	-1.67 ft NGVD	-1.39 ft NGVD
MEAN LOWER LOW WATER (MLLW)	-2.51 ft NGVD	-2.30 ft NGVD
LOWEST OBSERVED WATER LEVEL	-5.60 ft NGVD	-5.16 ft NGVD

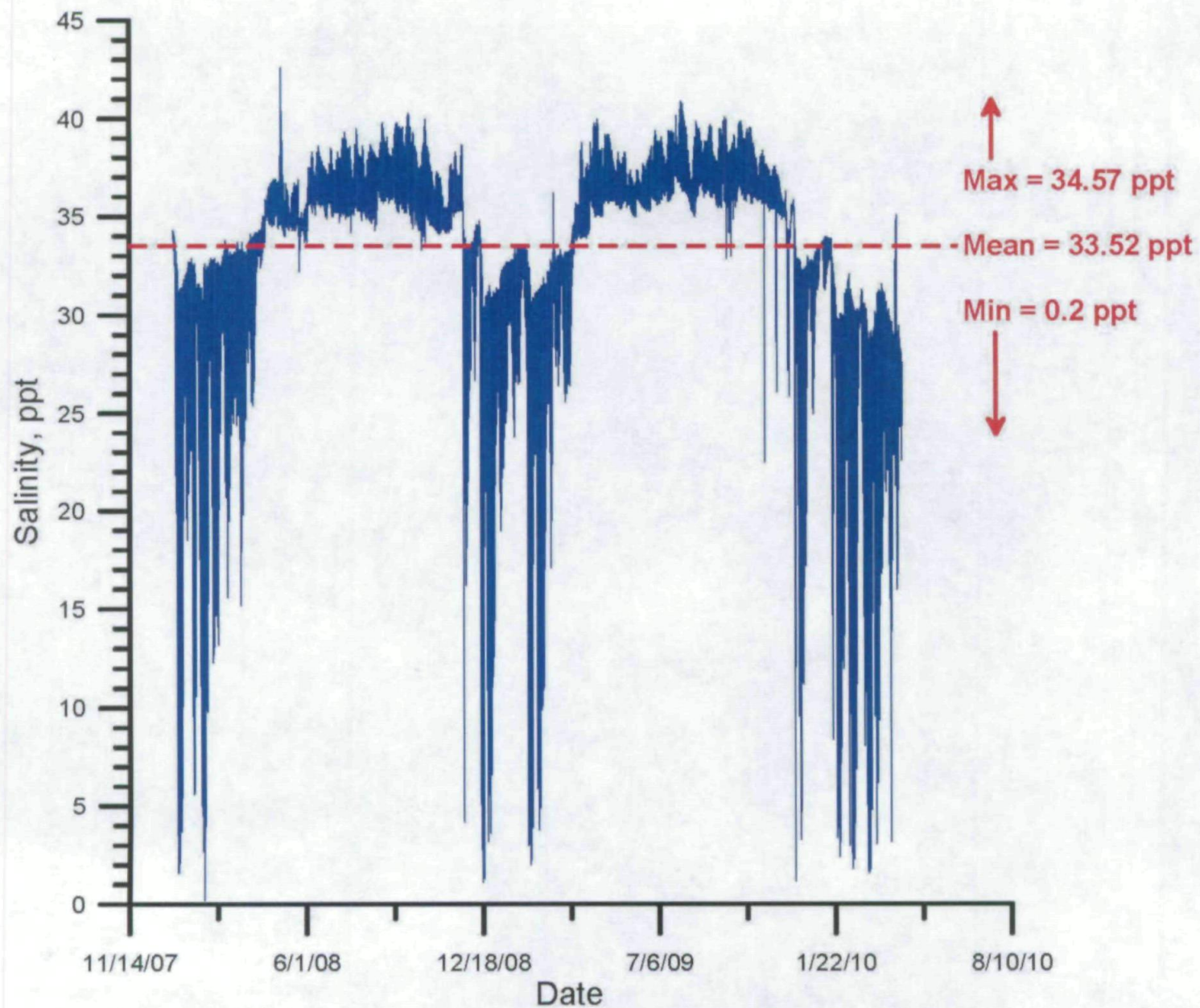


Figure 1: Salinity variation Otay River mouth, from Otay Sonde data base, 2007-2010.

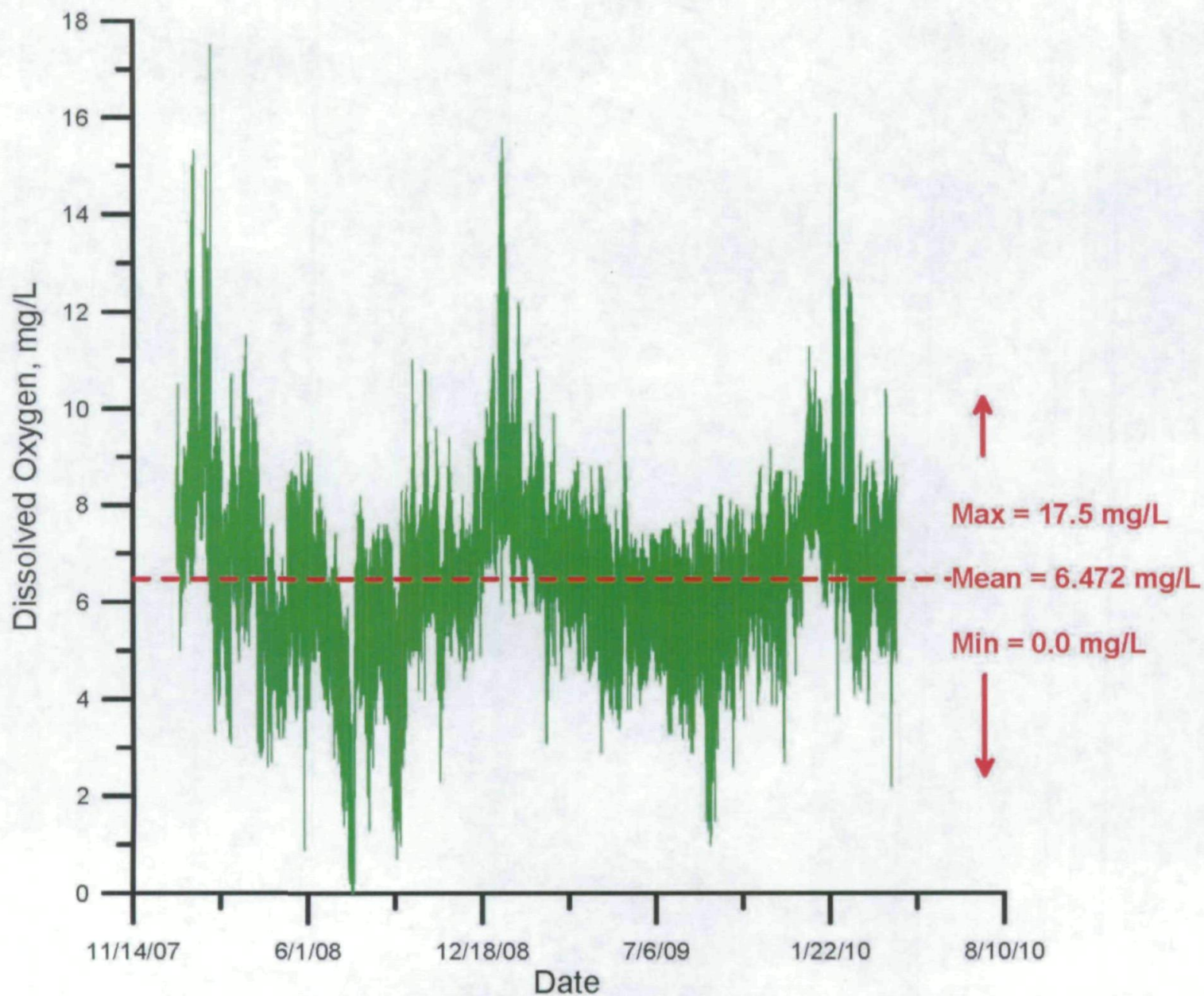


Figure 2: Dissolved oxygen variation Otay River mouth, from Otay Sonde data base, 2007-2010.

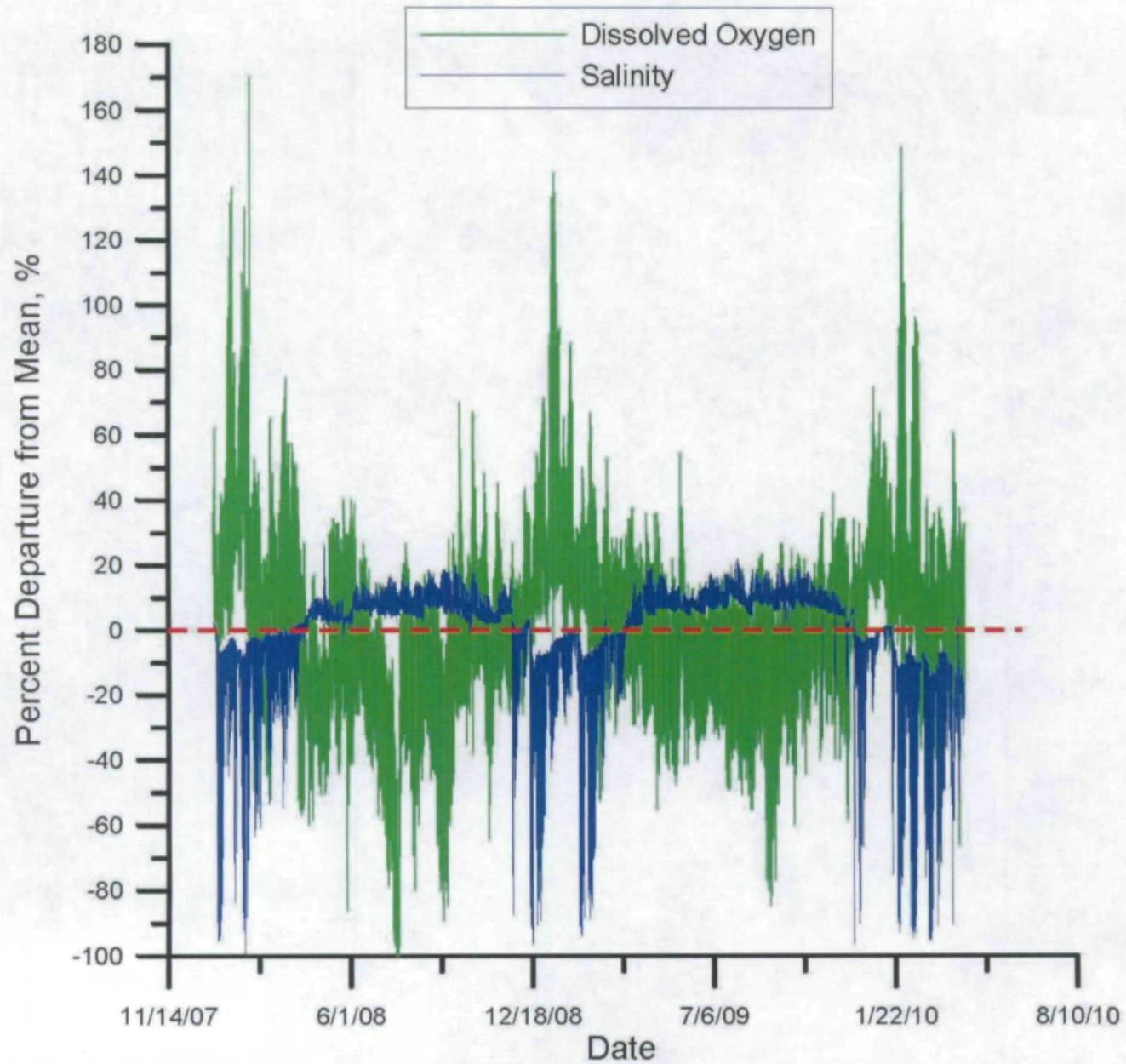


Figure 3: Variation in departures from the mean for salinity and dissolved oxygen in Otay River mouth, from Otay Sonde data base, 2007-2010.

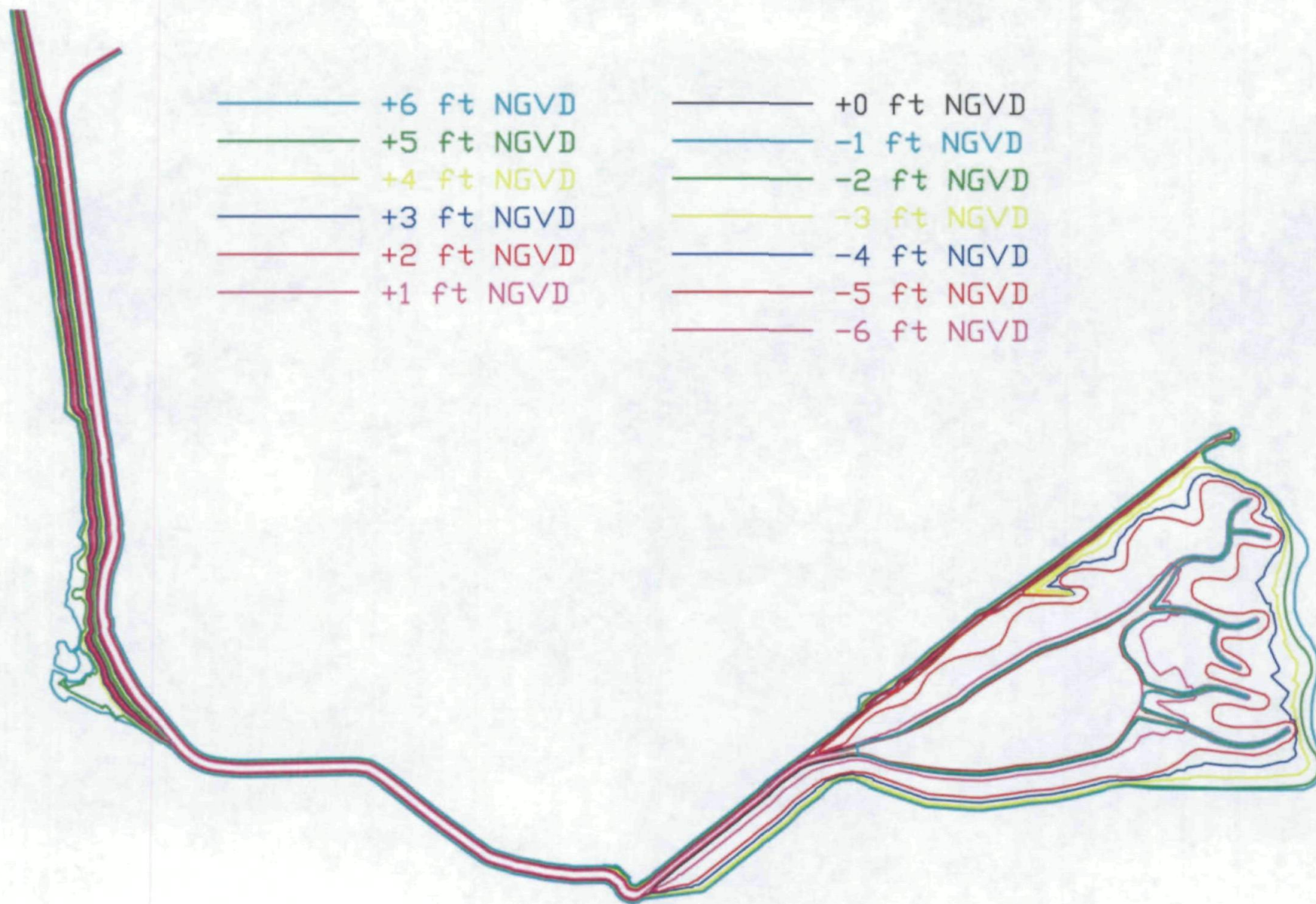


Figure 4. Contours for proposed Otay River tidal basin, ft NGVD.

Hydrologic Modeling

- Tidal Exchange
 - Will Channel Convey Potential Tidal Prism?
 - Tidal Range in Newly Created Basin?
 - Habitat Mix & Hydroperiod Function?

- Sediment Scour and Deposition
 - Will Inlet Stay Open?
 - Scour at Feeder Channel Pinch Points?
 - Basin Deposition?

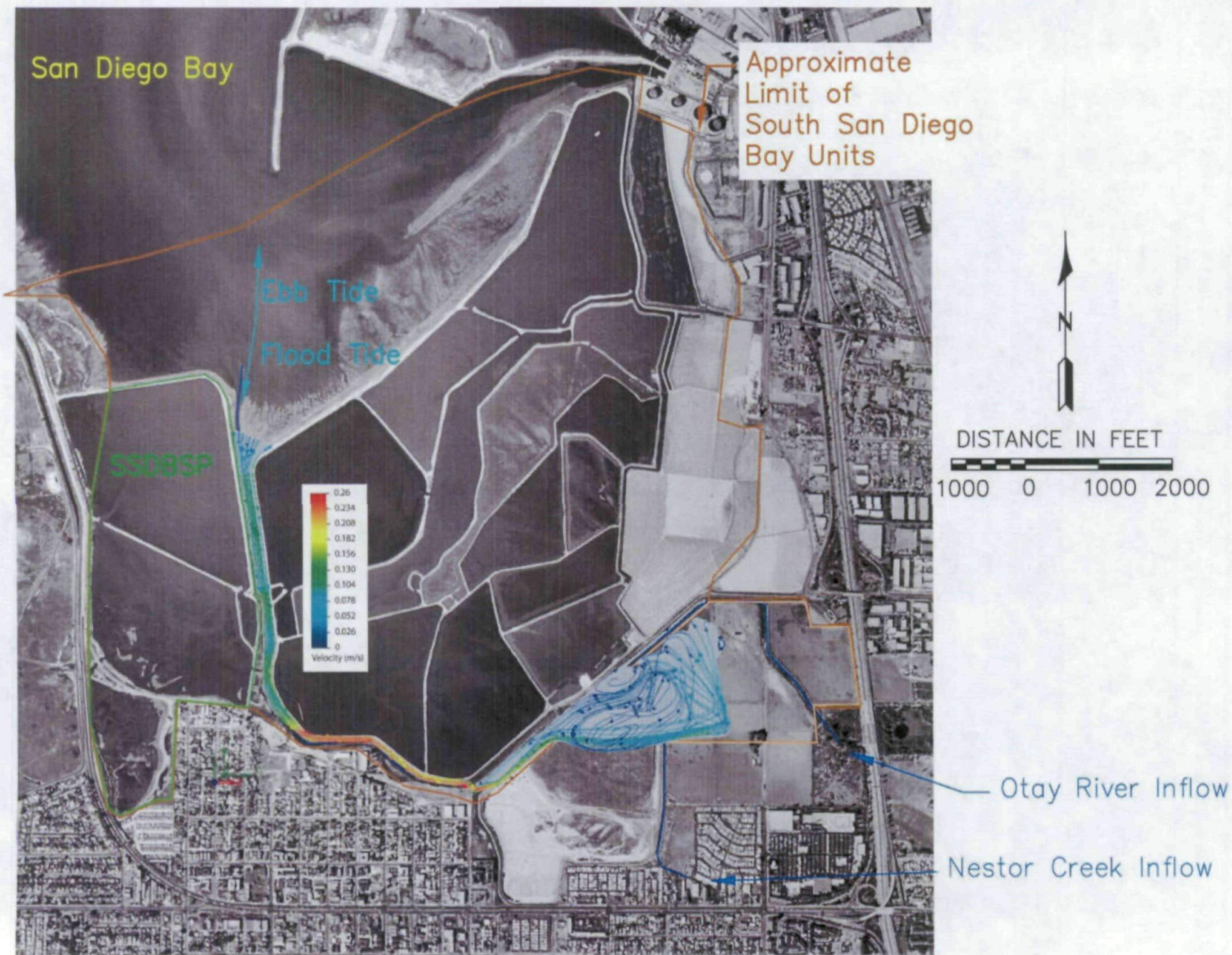


Figure 5a. Far field of hydrodynamic simulation of mean flood tide flow into proposed Otay River tidal basin.

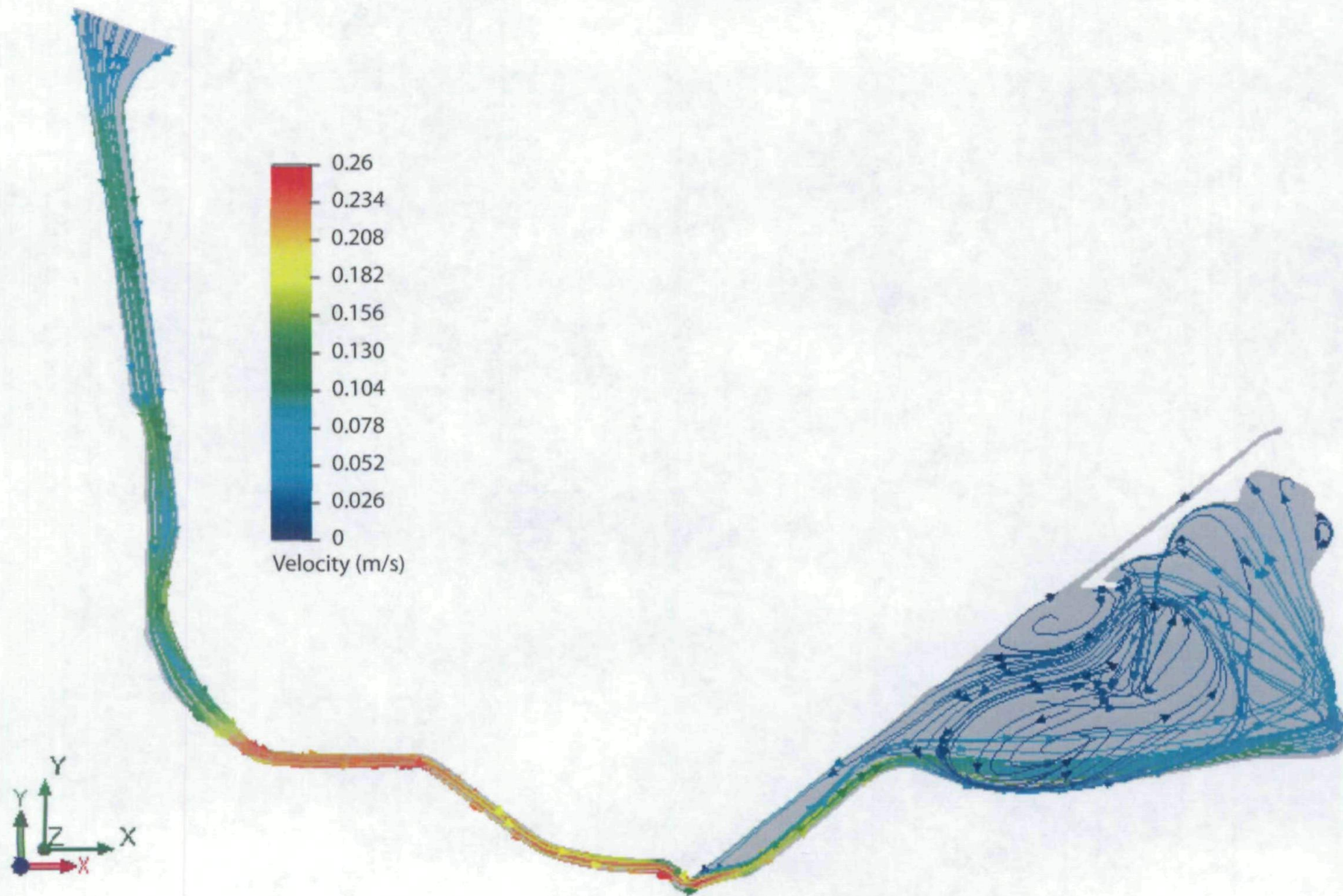


Figure 5. Hydrodynamic simulation of mean flood tide flow into proposed Otay River tidal basin.



Figure 5b. Far field of hydrodynamic simulation of mean ebb tide flow out of proposed Otay River tidal basin.

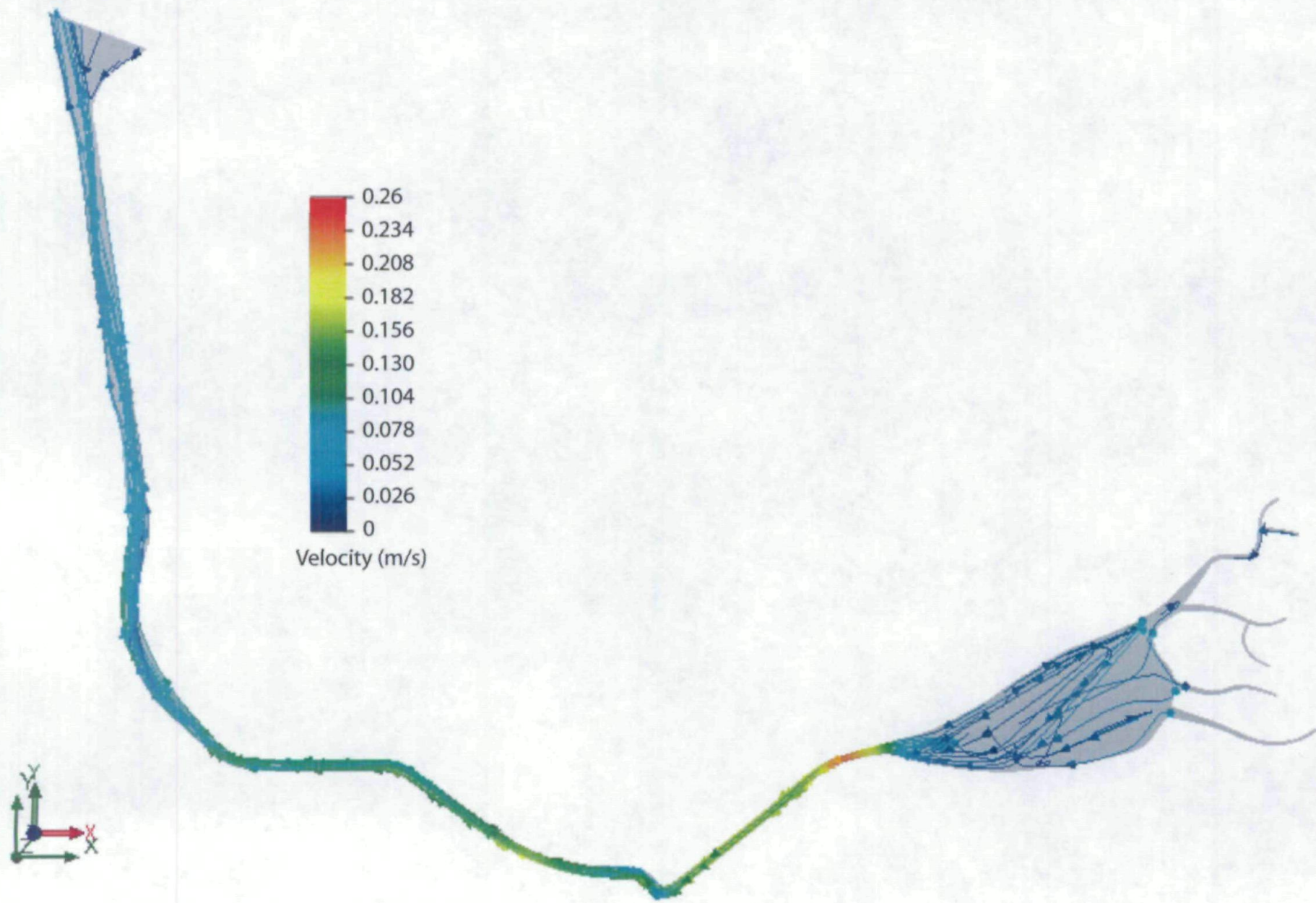


Figure 6. Hydrodynamic simulation of mean ebb tide flow out of proposed Otay River tidal basin.

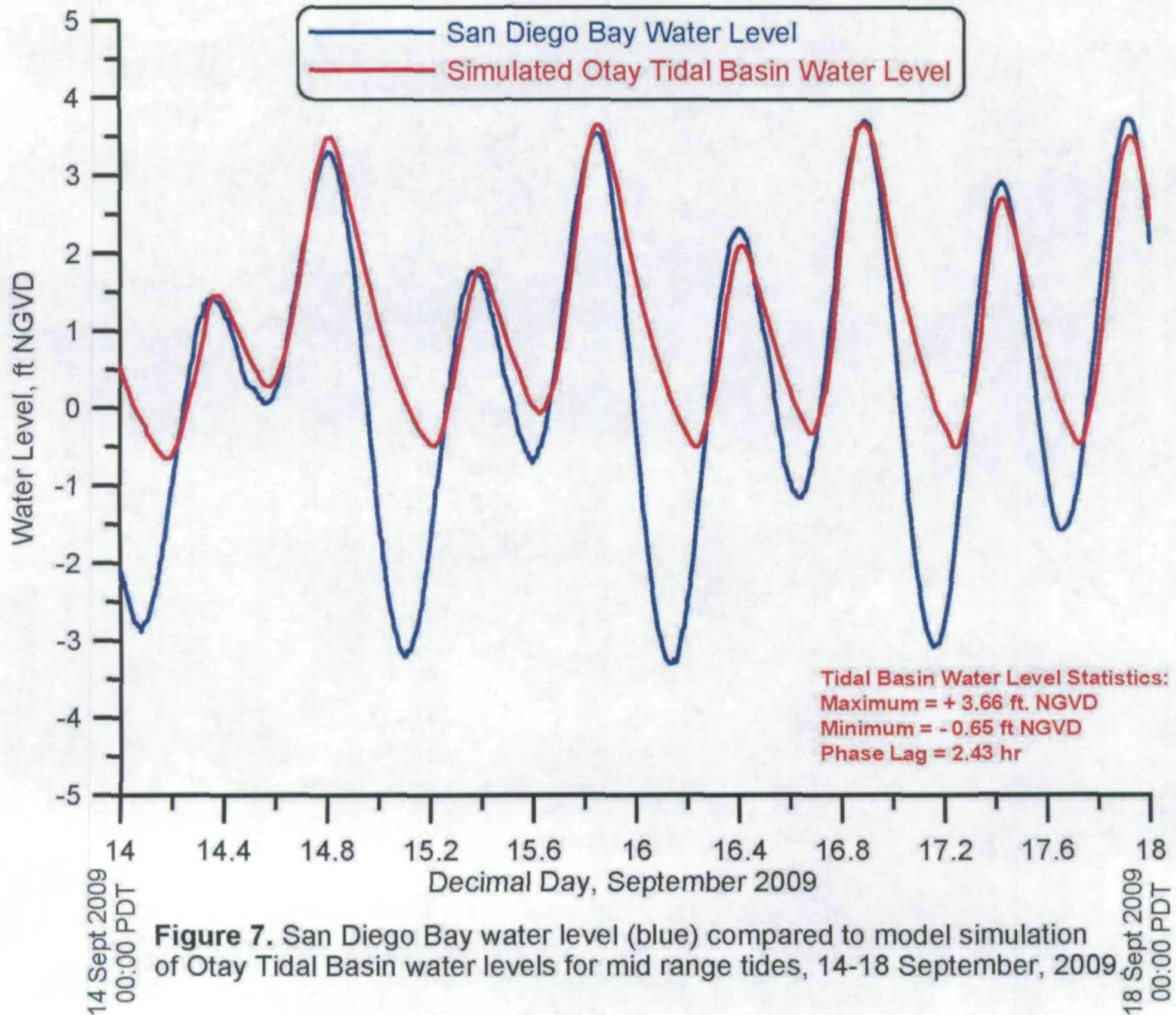


Figure 7. San Diego Bay water level (blue) compared to model simulation of Otay Tidal Basin water levels for mid range tides, 14-18 September, 2009

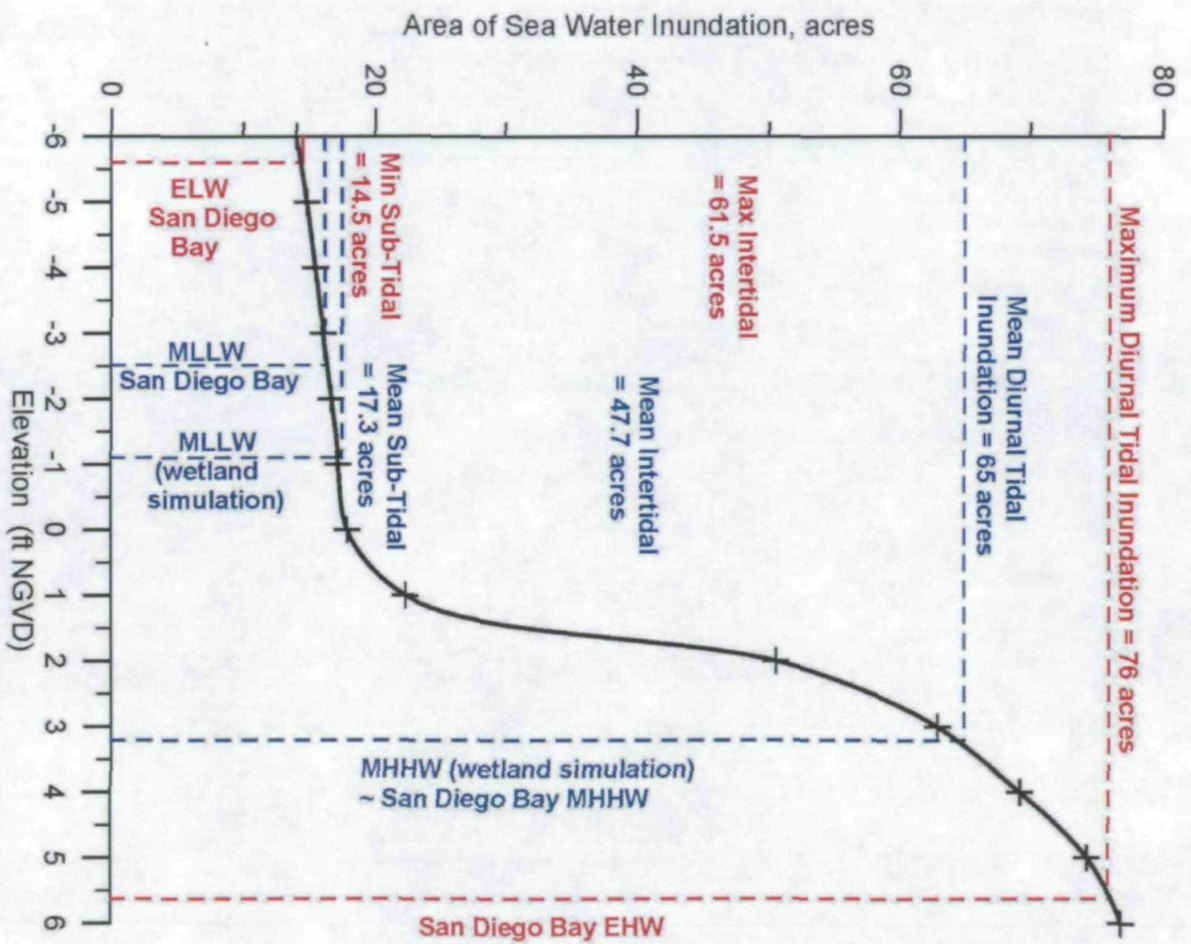


Figure 8. Stage area function of the tidal basin for the Otay Wetland Restoration Project. Water level data from NOAA tide gage 941-0170, Navy Pier, San Diego Bay.

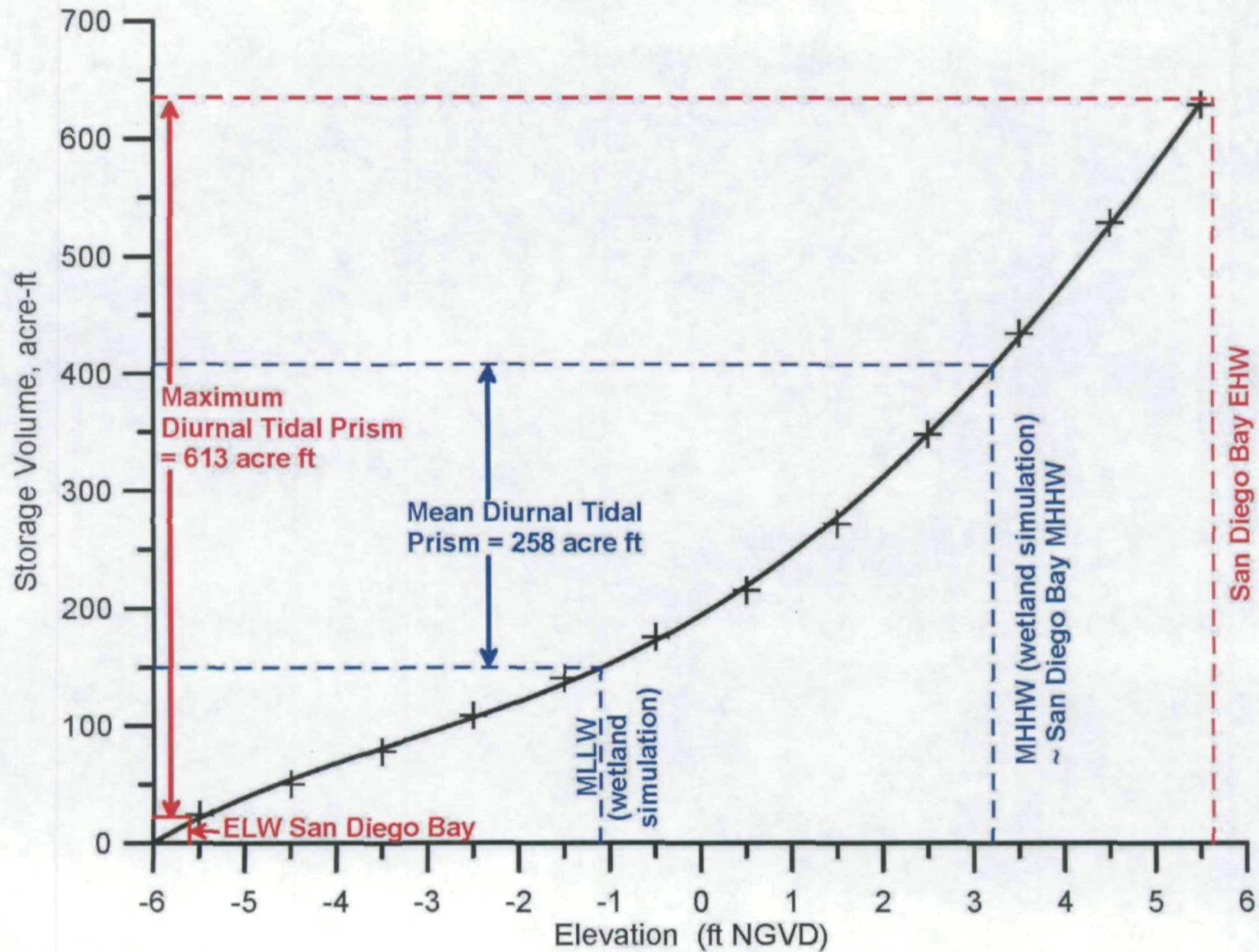
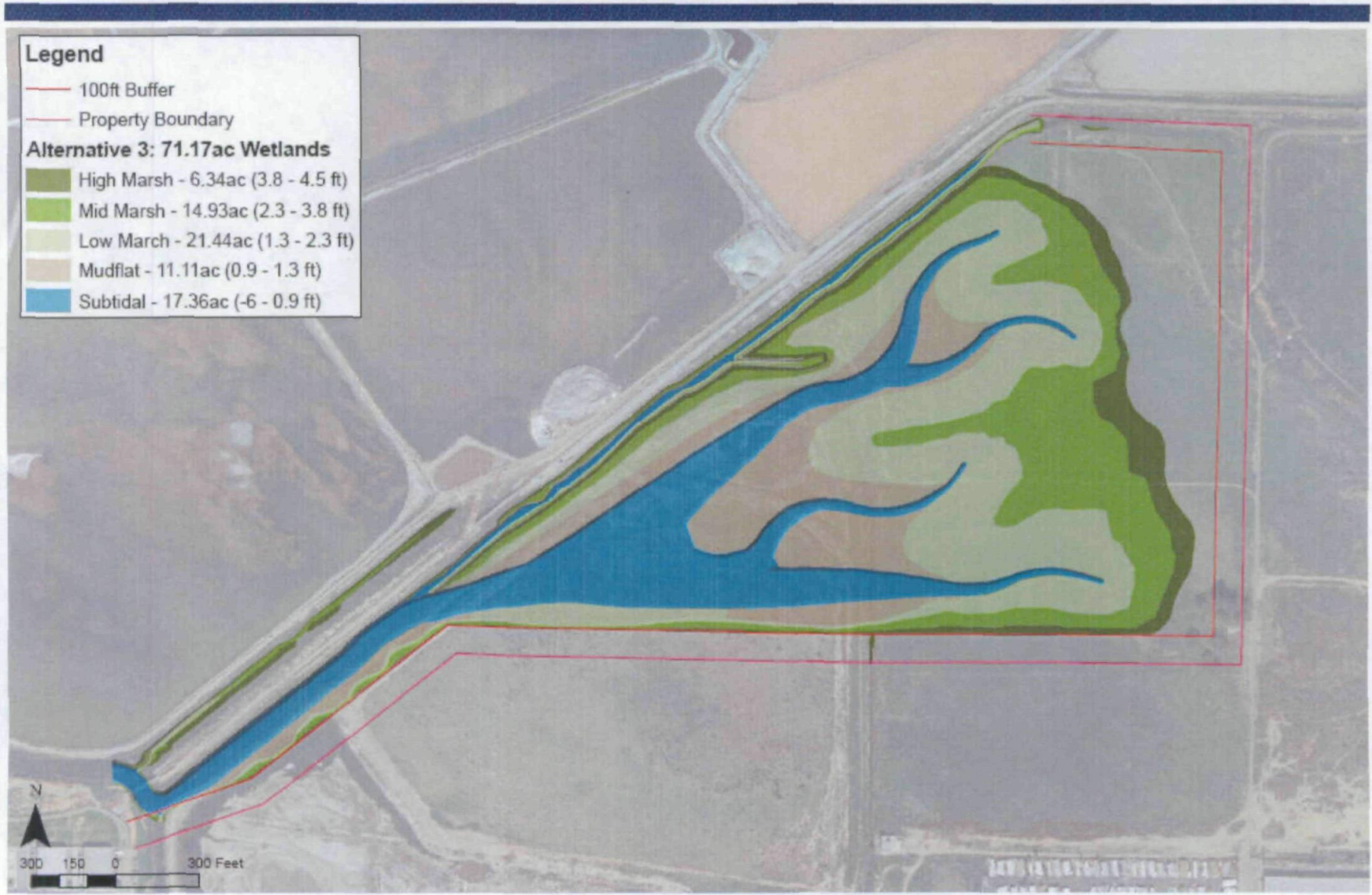


Figure 9. Storage rating function of the tidal basin and Otay River feeder channel for the Otay Wetland Restoration Project. Water level data from NOAA tide gage 941-0170, Navy Pier, San Diego Bay.

Otay River Floodplain Conceptual Restoration Plan – *Alternative 2*



Otay River Floodplain Conceptual Restoration Plan – *Alternative 3*



Compliance with CCC Standards

- a. Location within Southern California Bight
- b. Potential for restoration as tidal wetland
- c. Potential to restore at least 66 acres
- d. Provides a buffer zone and upland transition zone
- e. Any existing site contamination problems would be controlled or remedied and would not hinder restoration
- f. Site preservation is guaranteed in perpetuity to protect against future degradation or incompatible land use
- g. Feasible methods are available to protect the long-term wetland values on the site in perpetuity
- h. Does not result in a net loss of existing wetlands; and
- i. Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.

Compliance with CCC Objectives

- a. Provides maximum overall ecosystem benefits
- b. Provides substantial fish habitat compatible with other wetland values at the site
- c. Provides a buffer zone of an average of at least 300 ft wide, and not less than 100 ft wide
- d. Provides maximum upland transition areas
- e. Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats
- f. Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals
- g. Restoration design is most likely to produce and support wetland-dependent resources
- h. Provides rare or endangered species habitat
- i. Provides for restoration of reproductively isolated populations of native California species
- j. Results in an increase in the aggregate acreage of wetland in the Southern California Bight
- k. Requires minimum maintenance
- l. Restoration project can be accomplished in a reasonably timely fashion; and
- m. Site in proximity to the Carlsbad desalination facility.

Recommendation

- Regional Board approval of Otay River Floodplain Site and corresponding preliminary restoration plans.

POSEIDON RESOURCES MARINE LIFE MITIGATION PLAN

INTRODUCTION

Poseidon's Carlsbad desalination facility will be co-located with the Encina Power Station and will use the power plant's once-through cooling intake and outfall structures. The desalination facility is expected to use about 304 million gallons per day (mgd) of estuarine water drawn through the structure. The facility will operate both when the power plant is using its once-through cooling system and when it is not.

This Marine Life Mitigation Plan (the Plan) will result in mitigation necessary to address the entrainment impacts caused by the facility's use of estuarine water. The Plan includes two phases of mitigation – Poseidon is required during Phase I to provide at least 37 acres of estuarine wetland restoration, as described below. In Phase II, Poseidon is required to provide an additional 18.4 acres of estuarine wetland restoration. However, as described below, Poseidon may choose to provide all 55.4 acres of restoration during Phase I. Poseidon may also choose during Phase II to apply for a CDP to reduce or eliminate the required 18.4 acres of mitigation and instead conduct alternative mitigation by implementing new entrainment reduction technology or obtaining mitigation credit for conducting dredging.

CONDITION A: WETLAND RESTORATION MITIGATION

The permittee shall develop, implement and fund a wetland restoration project that compensates for marine life impacts from Poseidon's Carlsbad desalination facility.

1.0 PHASED IMPLEMENTATION

Phase I: Poseidon is to provide at least 37 acres of estuarine wetland restoration. Within two years of issuance of the desalination facility's coastal development permit (CDP), Poseidon is to submit a complete CDP application for a proposed restoration project, as described below.

Phase II: Poseidon is to provide an additional 18.4 acres of estuarine wetland restoration. Within five years of issuance of the Phase I CDP, Poseidon is to submit a complete CDP application proposing up to 18.4 acres of additional restoration, subject to reduction as described below.

2.0 SITE SELECTION

In consultation with Commission staff, the permittee shall select a wetland restoration site or sites for mitigation in accordance with the following process and terms.

Within 9 months of the effective date of this permit, the permittee shall submit the proposed site(s) and preliminary wetland restoration plan to the Commission for its review and approval or disapproval.

The location of the wetland restoration project(s) shall be within the Southern California Bight. The permittee shall select from sites including, but not limited to, the following eleven sites: Tijuana Estuary in San Diego County; San Dieguito River Valley in San Diego County; Agua Hedionda Lagoon in San Diego County; San Elijo Lagoon in San Diego County; Buena Vista Lagoon in San Diego County; Huntington Beach Wetland in Orange County. Anaheim Bay in

Orange County, Santa Ana River in Orange County, Los Cerritos Wetland in Los Angeles County, Ballona Wetland in Los Angeles County, and Ormond Beach in Ventura County. The permittee may also consider any sites that may be recommended by the California Department of Fish & Game as high priority wetlands restoration projects. Other sites proposed by the permittee may be added to this list with the Executive Director's approval.

The basis for the selection shall be an evaluation of the site(s) against the minimum standards and objectives set forth in subsections 3.1 and 3.2 below. The permittee shall take into account and give serious consideration to the advice and recommendations of the Scientific Advisory Panel (SAP) established and convened by the Executive Director pursuant to Condition B.1.0. The permittee shall select the site(s) that meets the minimum standards and best meets the objectives.

3.0 PLAN REQUIREMENTS

In consultation with Commission staff, the permittee shall develop a wetland restoration plan for the wetland site(s) identified through the site selection process. The wetland restoration plan shall meet the minimum standards and incorporate as many as feasible of the objectives in subsections 3.1 and 3.2, respectively.

3.1 Minimum Standards

The wetland restoration project site(s) and preliminary plan(s) must meet the following minimum standards:

- a. Location within Southern California Bight;
- b. Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas;
- c. Creates or substantially restores a minimum of 37 acres and up to at least 55.4 acres of habitat similar to the affected habitats in Agua Hedionda Lagoon, excluding buffer zone and upland transition area;
- d. Provides a buffer zone of a size adequate to ensure protection of wetland values, and at least 100 feet wide, as measured from the upland edge of the transition area.
- e. Any existing site contamination problems would be controlled or remediated and would not hinder restoration;
- f. Site preservation is guaranteed in perpetuity (through appropriate public agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use;
- g. Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;
- h. Does not result in a net loss of existing wetlands; and

- i. Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.

3.2 Objectives

The following objectives represent the factors that will contribute to the overall value of the wetland. The selected site(s) shall be determined to achieve these objectives. These objectives shall also guide preparation of the restoration plan.

- a. Provides maximum overall ecosystem benefits, e.g. maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;
- b. Provides substantial fish habitat compatible with other wetland values at the site(s);
- c. Provides a buffer zone of an average of at least 300 feet wide, and not less than 100 feet wide, as measured from the upland edge of the transition area.
- d. Provides maximum upland transition areas (in addition to buffer zones);
- e. Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats;
- f. Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;
- g. Restoration design is that most likely to produce and support wetland-dependent resources;
- h. Provides rare or endangered species habitat;
- i. Provides for restoration of reproductively isolated populations of native California species;
- j. Results in an increase in the aggregate acreage of wetland in the Southern California Bight;
- k. Requires minimum maintenance;
- l. Restoration project can be accomplished in a reasonably timely fashion; and,
- m. Site(s) in proximity to the Carlsbad desalination facility.

3.3 Restrictions

- a. The permittee may propose a wetland restoration project larger than the minimum necessary size specified in subsection 3.1(c) above, if biologically appropriate for the site(s), but the additional acreage must (1) be clearly identified, and (2) must not be the portion of the project best satisfying the standards and objectives listed above.

- b. If the permittee jointly enters into a restoration project with another party: (1) the permittee's portion of the project must be clearly specified, (2) any other party involved cannot gain mitigation credit for the permittee's portion of the project, and (3) the permittee may not receive mitigation credit for the other party's portion of the project.
- c. The permittee may propose to divide the mitigation requirement between a maximum of two wetland restoration sites, unless there is a compelling argument, approved by the Executive Director, that the standards and objectives of subsections 3.1 and 3.2 will be better met at more than two sites.

4.0 PLAN IMPLEMENTATION

4.1 Coastal Development Permit Applications

The permittee shall submit complete Coastal Development Permit applications for the Phase I and Phase II restoration plan(s) that shall include CEQA documentation and local or other state agency approvals. The CDP application for Phase I shall be submitted within 24 months following the issuance of the Coastal Development Permit for the Carlsbad desalination facility. The CDP application for Phase II shall be submitted within 5 years of issuance of the CDP for Phase I. The Executive Director may grant an extension to these time periods at the request of and upon a demonstration of good cause by the permittee. The restoration plans shall substantially conform to Section 3.0 above and shall include, but not be limited to the following elements:

- a. Detailed review of existing physical, biological, and hydrological conditions; ownership, land use and regulation;
- b. Evaluation of site-specific and regional restoration goals and compatibility with the goal of mitigating for Poseidon's marine life impacts;
- c. Identification of site opportunities and constraints;
- d. Schematic restoration design, including:
 - 1. Proposed cut and fill, water control structures, control measures for stormwater, buffers and transition areas, management and maintenance requirements;
 - 2. Planting program, including removal of exotic species, sources of plants and or seeds (local, if possible), protection of existing salt marsh plants, methods for preserving top soil and augmenting soils with nitrogen and other necessary soil amendments before planting, timing of planting, plans for irrigation until established, and location of planting and elevations on the topographic drawings;
 - 3. Proposed habitat types (including approximate size and location);
 - 4. Assessment of significant impacts of design (especially on existing habitat values) and net habitat benefits;
 - 5. Location, alignment and specifications for public access facilities, if feasible;
 - 6. Evaluation of steps for implementation e.g. permits and approvals, development agreements, acquisition of property rights;
 - 7. Cost estimates;

8. Topographic drawings for final restoration plan at 1" = 100 foot scale, one foot contour interval; and
 9. Drawings shall be directly translatable into final working drawings.
- g. Detailed information about how monitoring and maintenance will be implemented;
 - h. Detailed information about construction methods to be used;
 - i. Defined final success criteria for each habitat type and methods to be used to determine success;
 - j. Detailed information about how Poseidon will coordinate with the Scientific Advisory Panel including its role in independent monitoring, contingency planning review, cost recovery, etc.;
 - k. Detailed information about contingency measures that will be implemented if mitigation does not meet the approved goals, objectives, performance standards, or other criteria; and,
 - l. Submittal of "as-built" plans showing final grading, planting, hydrological features, etc. within 60 days of completing initial mitigation site construction.

4.2 Wetland Construction Phase

Within 6 months of approval of the Phase I restoration plan, subject to the permittee's obtaining the necessary permits, the permittee shall commence the construction phase of the wetland restoration project. The permittee shall be responsible for ensuring that construction is carried out in accordance with the specifications and within the timeframes specified in the approved final restoration plan and shall be responsible for any remedial work or other intervention necessary to comply with final plan requirements.

4.3 Timeframe for Resubmittal of Project Elements

If the Commission does not approve any element of the project (i.e. site selection, restoration plan), the Commission will specify the time limits for compliance relative to selection of another site or revisions to the restoration plan.

5.0 WETLAND MONITORING, MANAGEMENT AND REMEDIATION

Monitoring, management (including maintenance), and remediation shall be conducted over the "full operating life" of Poseidon's desalination facility, which shall be 30 years from the date "as-built" plans are submitted pursuant to subsection 4.1(1).

The following section describes the basic tasks required for monitoring, management and remediation. Condition B specifies the administrative structure for carrying out these tasks, including the roles of the permittee and Commission staff.

5.1 Monitoring and Management Plan

A monitoring and management plan will be developed in consultation with the permittee and appropriate wildlife agencies, concurrently with the preparation of the restoration plan to provide an overall framework to guide the monitoring work. It will include an overall description of the studies to be conducted over the course of the monitoring program and a description of management tasks that are anticipated, such as trash removal. Details of the monitoring studies and management tasks will be set forth in a work program (see Condition B).

5.2 Pre-restoration site monitoring

Pre-restoration site monitoring shall be conducted to collect baseline data on the wetland attributes to be monitored. This information will be incorporated into and may result in modification to the overall monitoring plan.

5.3 Construction Monitoring

Monitoring shall be conducted during and immediately after each stage of construction of the wetland restoration project to ensure that the work is conducted according to plans.

5.4 Post-Restoration Monitoring and Remediation

Upon completion of construction of the wetland(s), monitoring shall be conducted to measure the success of the wetland(s) in achieving stated restoration goals (as specified in the restoration plan(s)) and in achieving performance standards, specified below. The permittee shall be fully responsible for any failure to meet these goals and standards during the facility's full operational years. Upon determining that the goals or standards are not achieved, the Executive Director shall prescribe remedial measures, after consultation with the permittee, which shall be immediately implemented by the permittee with Commission staff direction. If the permittee does not agree that remediation is necessary, the matter may be set for hearing and disposition by the Commission.

Successful achievement of the performance standards shall (in some cases) be measured relative to approximately four reference sites, which shall be relatively undisturbed, natural tidal wetlands within the Southern California Bight. The Executive Director shall select the reference sites. The standard of comparison, i.e., the measure of similarity to be used (e.g., within the range, or within the 95% confidence interval) shall be specified in the work program.

In measuring the performance of the wetland project, the following physical and biological performance standards will be used:

- a. **Longterm Physical Standards.** The following long-term standards shall be maintained over the full operative life of the desalination facility:
 1. **Topography.** The wetland(s) shall not undergo major topographic degradation (such as excessive erosion or sedimentation);
 2. **Water Quality.** Water quality variables [to be specified] shall be similar to reference wetlands;
 3. **Tidal prism.** If the mitigation site(s) require dredging, the tidal prism shall be maintained and tidal flushing shall not be interrupted; and.

4. **Habitat Areas.** The area of different habitats shall not vary by more than 10% from the areas indicated in the restoration plan(s).
- b. **Biological Performance Standards.** The following biological performance standards shall be used to determine whether the restoration project is successful. Table 1, below, indicates suggested sampling locations for each of the following biological attributes; actual locations will be specified in the work program:
1. **Biological Communities.** Within 4 years of construction, the total densities and number of species of fish, macroinvertebrates and birds (see Table 1) shall be similar to the densities and number of species in similar habitats in the reference wetlands;
 2. **Vegetation.** The proportion of total vegetation cover and open space in the marsh shall be similar to those proportions found in the reference sites. The percent cover of algae shall be similar to the percent cover found in the reference sites;
 3. **Spartina Canopy Architecture.** The restored wetland shall have a canopy architecture that is similar in distribution to the reference sites, with an equivalent proportion of stems over 3 feet tall;
 4. **Reproductive Success.** Certain plant species, as specified by in the work program, shall have demonstrated reproduction (i.e. seed set) at least once in three years;
 5. **Food Chain Support.** The food chain support provided to birds shall be similar to that provided by the reference sites, as determined by feeding activity of the birds; and
 6. **Exotics.** The important functions of the wetland shall not be impaired by exotic species.

Table 1: Suggested Sampling Locations

	Salt Marsh			Open Water		Mudflat	Tidal Creeks
	Spartina	Salicornia	Upper	Lagoon	Eelgrass		
1) Density/spp:							
- Fish				X	X	X	X
- Macroinvertebrates				X	X	X	X
- Birds	X	X	X	X		X	X
2) % Cover							
Vegetation	X	X	X		X		
algae	X	X				X	
3) Spartina architecture	X						
4) Reproductive success	X	X	X				
5) Bird feeding				X		X	X

6) Exotics	X	X	X	X	X	X	X
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6.0 ALTERNATIVE MITIGATION

As part of Phase II, Poseidon may propose in its CDP application alternatives to reduce or eliminate the required 18.4 acres of mitigation. The alternative mitigation proposed may be in the form of implementing new entrainment reduction technology or may be mitigation credits for conducting dredging, either of which could reduce or eliminate the 18.4 acres of mitigation.

CONDITION B: ADMINISTRATIVE STRUCTURE

1.0 ADMINISTRATION

Personnel with appropriate scientific or technical training and skills will, under the direction of the Executive Director, oversee the mitigation and monitoring functions identified and required by Condition A. The Executive Director will retain scientific and administrative support staff needed to perform this function, as specified in the work program.

This technical staff will oversee the preconstruction and post-construction site assessments, mitigation project design and implementation (conducted by permittee), and monitoring activities (including plan preparation); the field work will be done by contractors under the Executive Director's direction. The contractors will be responsible for collecting the data, analyzing and interpreting it, and reporting to the Executive Director.

The Executive Director shall convene a Scientific Advisory Panel to provide the Executive Director with scientific advice on the design, implementation and monitoring of the wetland restoration. The panel shall consist of recognized scientists, including a marine biologist, an ecologist, a statistician and a physical scientist.

2.0 BUDGET AND WORK PROGRAM

The funding necessary for the Commission and the Executive Director to perform their responsibilities pursuant to these conditions will be provided by the permittee in a form and manner reasonably determined by the Executive Director to be consistent with requirements of State law, and which will ensure efficiency and minimize total costs to the permittee. The amount of funding will be determined by the Commission on a biennial basis and will be based on a proposed budget and work program, which will be prepared by the Executive Director in consultation with the permittee, and reviewed and approved by the Commission in conjunction with its review of the restoration plan. If the permittee and the Executive Director cannot agree on the budget or work program, the disagreement will be submitted to the Commission for resolution.

The budget to be funded by the permittee will be for the purpose of reasonable and necessary costs to retain personnel with appropriate scientific or technical training and skills needed to assist the Commission and the Executive Director in carrying out the mitigation and lost resource compensation conditions. In addition, reasonable funding will be included in this budget for necessary support personnel, equipment, overhead, consultants, the retention of contractors

needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel(s) convened by the Executive Director for the purpose of implementing these conditions.

Costs for participation on any advisory panel shall be limited to travel, per diem, meeting time and reasonable preparation time and shall only be paid to the extent the participant is not otherwise entitled to reimbursement for such participation and preparation. The amount of funding will be determined by the Commission on a biennial basis and will be based on a proposed budget and work program, which will be prepared by the Executive Director in consultation with the permittee, and reviewed and approved by the Commission in conjunction with its review of the restoration plan. If the permittee and the Executive Director cannot agree on the budget or work program, the disagreement will be submitted to the Commission for resolution. Total costs for such advisory panel shall not exceed \$100,000 per year adjusted annually by any increase in the consumer price index applicable to California.

The work program will include:

- a. A description of the studies to be conducted over the subsequent two year period, including the number and distribution of sampling stations and samples per station, methodology and statistical analysis (including the standard of comparison to be used in comparing the mitigation project to the reference sites);
- b. A description of the status of the mitigation projects, and a summary of the results of the monitoring studies to that point;
- c. A description of four reference sites;
- d. A description of the performance standards that have been met, and those that have yet to be achieved;
- e. A description of remedial measures or other necessary site interventions;
- f. A description of staffing and contracting requirements; and,
- g. A description of the Scientific Advisory Panel's role and time requirements in the two year period.

The Executive Director may amend the work program at any time, subject to appeal to the Commission.

3.0 ANNUAL REVIEW AND PUBLIC WORKSHOP REVIEW

The permittee shall submit a written review of the status of the mitigation project to the Executive Director no later than April 30 each year for the prior calendar year. The written review will discuss the previous year's activities and overall status of the mitigation project, identify problems and make recommendations for solving them, and review the next year's program.

To review the status of the mitigation project, the Executive Director will convene and conduct a duly noticed public workshop during the first year of the project and every other year thereafter unless the Executive Director deems it unnecessary. The meeting will be attended by the contractors who are conducting the monitoring, appropriate members of the Scientific Advisory Panel, the permittee, Commission staff, representatives of the resource agencies (CDFG, NMFS, USFWS), and the public. Commission staff and the contractors will give presentations on the previous biennial work program's activities, overall status of the mitigation project, identify problems and make recommendations for solving them, and review the next upcoming period's biennial work program.

The public review will include discussions on whether the wetland mitigation project has met the performance standards, identified problems, and recommendations relative to corrective measures necessary to meet the performance standards. The Executive Director will use information presented at the public review, as well as any other relevant information, to determine whether any or all of the performance standards have been met, whether revisions to the standards are necessary, and whether remediation is required. Major revisions shall be subject to the Commission's review and approval.

The mitigation project will be successful when all performance standards have been met each year for a three-year period. The Executive Director shall report to the Commission upon determining that all of the performance standards have been met for three years and that the project is deemed successful. If the Commission determines that the performance standards have been met and the project is successful, the monitoring program will be scaled down, as recommended by the Executive Director and approved by the Commission. A public review shall thereafter occur every five years, or sooner if called for by the Executive Director. The work program shall reflect the lower level of monitoring required. If subsequent monitoring shows that a standard is no longer being met, monitoring may be increased to previous levels, as determined necessary by the Executive Director.

The Executive Director may make a determination on the success or failure to meet the performance standards or necessary remediation and related monitoring at any time, not just at the time of the workshop review.

4.0 ADDITIONAL PROCEDURES

4.1 Dispute Resolution

In the event that the permittee and the Executive Director cannot reach agreement regarding the terms contained in or the implementation of any part of this Plan, the matter may be set for hearing and disposition by the Commission.

4.2 Extensions

Any of the time limits established under this Plan may be extended by the Executive Director at the request of the permittee and upon a showing of good cause.

CONDITION C: SAP DATA MAINTENANCE

The permittee shall make available on a publicly-accessible website all scientific data collected as part of the project. The website and the presentation of data shall be subject to Executive Director review and approval.

**COMPARISON OF SELECTED SOUTHERN CALIFORNIA TIDAL WETLANDS
AS POTENTIAL SITES
FOR MITIGATION OF IMPACTS ASSOCIATED WITH
POSEIDON RESOURCES PROPOSED CARLSBAD DESALINATION PLANT**



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January 2010

INTRODUCTION

Poseidon Resources Corporation (Poseidon) proposes to operate a desalination plant at Aqua Hedionda Lagoon, in the City of Carlsbad, California. The Carlsbad Desalination Project (CDP) is designed to operate in conjunction with the existing Encina Power Station (EPS) by using the EPS cooling water discharge as its source of water when the power plant is operating.

In August 2008, the California Coastal Commission (Coastal Commission) approved the final Marine Life Mitigation Plan (MLMP) for the project to provide mitigation for the desalination facility's anticipated entrainment and impingement impacts through creation, enhancement, or restoration of aquatic and wetland habitat, and ensured long-term performance, monitoring, and protection of the approved mitigation measures in a manner consistent with the Coastal Act Sections 30230 and 30231.

The conditions of the MLMP required that Poseidon develop a mitigation plan to restore approximately 66 acres of tidal wetlands to offset project impacts. The Coastal Commission directed Poseidon to investigate restoration opportunities at 11 wetlands within the southern California bight. These sites included:

- Tijuana Estuary in San Diego County,
- San Dieguito River Valley in San Diego County,
- Aqua Hedionda Lagoon in San Diego County,
- San Elijo Lagoon in San Diego County,
- Buena Vista Lagoon in San Diego County,
- Huntington Beach Wetlands in Orange County,
- Anaheim Bay in Orange County,
- Santa Ana River in Orange County,
- Los Cerritos Wetlands in Los Angeles County,
- Ballona Wetlands in Los Angeles County,
- and Ormond Beach in Ventura County,

In addition, Poseidon may consider any sites that may be recommended by the California Department of Fish and Game (CDFG) as "high priority wetlands restoration projects". This analysis includes an evaluation of potential restoration opportunity at the U.S. Fish and Wildlife Service San Diego Bay National Wildlife Refuge.

On May 9, 2009, the Regional Water Quality Control Board (RWQCB) approved the MLMP as a condition of the National Pollution Discharge Elimination System permit required for the project. The RWQCB conditioned this approval by requiring that mitigation occur within San Diego County unless all opportunities for restoration in the County proved to be infeasible. Thus, although this assessment includes restoration opportunities located in Orange, Los Angeles and Ventura counties, restoration in San Diego County wetlands are considered higher priority.

With the inclusion of the San Diego Bay National Wildlife Refuge restoration, this analysis compares the restoration potential of 12 southern California wetlands according to Coastal Commission requirements. The final goal of this analysis is to rank the potential restoration sites against standard feasibility criteria and the objectives set forth in the MLMP. The analysis includes a comparison of a number of factors, including status of supporting technical studies conducted for restoration plans at each wetland, proposed distribution of habitats created, potential impacts on existing habitats, and potential for compliance with Coastal Commission goals and objectives. The details available for restoration of each wetland varied, as did the dates of those plans. Some plans are relatively detailed, while others are conceptual. Some plans focus on active restoration/creation of tidal wetlands while other plans focus on restoration of non-tidal wetlands or acquisition of property, or passive restoration. Thus, ranking of the potential value of each restoration opportunity is somewhat subjective, although every attempt has been made to avoid bias.

The analysis is presented in a geographical order, from south to north, as presented in the MLMP. A summary of existing restoration planning is presented for each wetland. The potential compatibility of each wetland restoration plan with Coastal Commission requirements of Poseidon follows these summaries.

TIJUANA ESTUARY

Wetland restoration planning and implementation at Tijuana Estuary has been ongoing for over 20 years, beginning in 1986 with large-scale restoration planning funded by the California State Coastal Conservancy (Coastal Conservancy). Plans for restoring approximately 495 acres of tidal marsh in the southern arm of Tijuana Estuary were developed in the late 1980s culminating in the preparation of the Tijuana Estuary Tidal Restoration Program (TETRP) EIS/EIR in 1991 (Entrix et al. 1991). The first phase of TETRP, including a 2.5-acre restoration in the north arm known as the Oneonta Tidal Linkage, and a 20-acre restoration in the south arm known as the Model Marsh, were constructed in 1996 and 2000, respectively. The 495-acre restoration in the south arm was deferred to a later date. In 2003, the Coastal Conservancy funded a renewed look at restoration of the south arm. In 2008, the Tijuana Estuary-Friendship Marsh Restoration Feasibility and Design Study was completed (Tierra Environmental Services March 2008). The feasibility and design study identified a smaller potential restoration area (250 acres) in the south arm of the estuary.

Status of Existing Plans. A restoration feasibility and design study was completed March 2008 with funding from the Coastal Conservancy. A preferred restoration alternative was identified that included approximately 250 acres of wetland restoration (see figures 2-1 and 4-2 of the feasibility and design study).

Status of Environmental Documentation. No Environmental Documentation has been prepared to date. The feasibility and design study identified the need for a project-specific EIR.



FIGURE 2-1

Regional Location Map



FIGURE 4-2

Alternative B (Preferred) Restoration Plan and Habitat Configurations

Status of Required Permits. The feasibility and design study identified the need for the following permits:

- U.S. Army Corps of Engineers Section 404 permit;
- Regional Water Quality Control Board Section 401 Water Quality Certification;
- California Department of Fish and Game Streambed Alteration Agreement;
- California Coastal Commission Coastal Development Permit;
- U.S. Fish and Wildlife Service Section 7 Federal Endangered Species Act Consultation.

Any potential disposal of excavated soils in the ocean would require an encroachment permit from the State Lands Commission and a Section 10 permit from the USACOE. To date, there has been no action regarding acquisition of the identified permits.

Habitat Distribution. The 250-acre preferred project alternative was planned to be implemented in five phases creating five native habitats as indicated Table 1.

Table 1. Tijuana Estuary Restoration Project Proposed. Phasing and Habitat Distribution, March 2008.

Phase	Habitat (acres)					Total
	Open Water	Mudflat	Low Salt Marsh	Mid-High Salt Marsh	Transition	
1	22.9	6.1	4.1	3.1	2.5	38.7
2	7.7	6.1	10.8	12.7	0	37.3
3	13.0	18.3	23.7	19.9	0	74.9
4	5.5	11.5	5.5	9.2	0	31.7
5	12.0	18.5	15.9	16.3	4.6	67.3
total	61.1	60.5	60.0	61.2	7.1	250

All created wetland habitats would be below 4.9 feet NGVD, the estimated Mean Higher High Water level.

Potential Impacts to Existing Habitats. The majority of the impacts associated with implementation of the preferred alternative are to disturbed upland habitats. However, some of these proposed impacts would affect areas currently considered wetlands by resource agencies. The feasibility study presents each alternative as being "self-mitigating"; however, there has been no attempt to seek concurrence by the resource agencies to date. Impacts of the preferred alternative by are presented in Table 2:

Table 2. Tijuana Estuary Restoration Project Proposed. Impacts by Habitat and Phase. March 2008.

Phase	Habitat (acres)										Total
	Open Water	Salt Marsh	Dist. Salt Marsh	Dist. Salt Panne	Mulefat Scrub	Dist. Mulefat Scrub	Dist. Trans. Zone	Dist. Willow Scrub	Dist. Brackish Marsh	NNG	
1	0	0.06	4.93	0.36	0	22.73	0	0	0		28.08
2	0.02	1.34	12.46	0	0		4.14	0	0	17.49	35.45
3	0	0.56	16.79	0	1.84	13.07	0	0.89	0.01	0	33.16
4	0	0	17.14	13.08	0	0.22	0	0	0	0	30.44
5			7.53	2.48		8.06				45.33	63.40
total	0.02	1.96	58.85	15.92	1.84	44.08	4.14	0.89	45.34	17.49	190.5

Dist. = Disturbed, Trans. = Transition; NNG = Non-native Grassland

Land Ownership. The 250-acre restoration site is located in Border Field State Park on land owned by California Department of Parks and Recreation (California State Parks). California State Parks has been a partner with the Coastal Conservancy in the development of the restoration plan. As stated previously, potential disposal sites are owned or regulated by other entities.

Ease of Compliance with Coastal Commission Objectives and Criteria. Tijuana Estuary is composed of a northern and southern arm, with the central portion dominated by the Tijuana River. The northern arm is relatively pristine salt marsh and has been selected as a reference site by the Coastal Commission's Scientific Advisory Panel for the San Onofre Nuclear Generating Station (SONGS) restoration project in San Dieguito Lagoon. The potential for successful restoration in the northern arm is high.

Restoration at the southern arm of the estuary carries somewhat higher risk. This portion of the estuary has been impacted by sedimentation associated with cross-border canyons which was the focus of restoration planning efforts. A series of sedimentation basins were constructed in 2005 to capture sediment crossing the border, significantly reducing the risk of sedimentation from cross border canyons. Thus, the risk of loss of a restored site from sediment deposition has been significantly reduced. The feasibility and design study addressed sedimentation as an important issues and the restoration site has been designed to accommodate sediment that may remain in the general area from prior depositional events. Sedimentation and scour from the Tijuana River was also identified as a potential risk to wetland restoration at Tijuana Estuary. A low berm and weir were incorporated into the designed to pass flood flows and prevent scour or sediment deposition at the restored wetland.

The disposal of sediment excavated for restoration at Tijuana Estuary presents additional uncertainty. The feasibility study identifies several disposal scenarios, including disposal at a former sand mining operation in Lakeside, California. Disposal at this site would require truck round-trips of approximately 70 miles.

As stated previously, the restoration plan developed for the site would impact degraded wetland habitats that, nonetheless, may be considered as existing wetland by the Coastal Commission. While the feasibility study presents each restoration phase as being self-mitigating, to date there has been no effort to seek agency resource concurrence.

SAN DIEGO BAY NATIONAL WILDLIFE REFUGE

The San Diego National Wildlife Refuge consists of the Sweetwater Marsh and South San Diego Bay Units. The 316-acre Sweetwater Marsh Unit is located along the eastern edge of San Diego Bay and includes tidally influenced salt marsh, disturbed upland habitat, and the D Street Fill, an old dredge disposal site that is used as nesting habitat by California least terns and western snowy plovers. The Sweetwater Marsh Unit is owned by the USFWS. The South San Diego Bay Unit includes 2,300 acres, most of which are leased to the USFWS by the State Lands Commission. This unit includes portions of the open bay, solar salt

evaporation ponds (1,068 acres), and the western end of the Otay River drainage basin, including approximately 140 acres of upland and wetland habitat.

Status of Existing Plans. A Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS) was prepared to provide a 15-year strategy for management of the refuge, including restoration alternatives. The CCP/EIS was adopted and a Record of Decision was issued in 2006. Preferred alternatives were identified for both the Sweetwater Marsh and South San Diego Bay Units. The preferred alternative for the Sweetwater Marsh Unit includes restoration of up to 21 acres of tidally influenced wetlands, located at three sites within the Unit. The preferred alternative for the South San Diego Bay Unit includes the restoration of approximately 650 acres of tidal wetlands, primarily from the conversion of solar evaporation ponds to tidal wetlands accomplished by breaching existing levees and allowing low marsh habitat to develop. The approximately 140-acre Otay River Floodplain Subarea, located south and west of the southernmost salt ponds, would be excavated and restored to tidal mudflat and salt marsh (see figures 1-2 and 2-11 of the CCP/EIS).

Recently (summer 2009), the USFWS was awarded two federal grants, one from the National Coastal Wetland Conservation (NCWC) and one from the National Oceanic and Atmospheric Administration (NOAA), for the restoration of approximately 230 acres of wetlands within the South San Diego Bay Unit. The restoration entails the conversion of solar evaporation ponds 10, 10a, and 11, also known as the western ponds, to intertidal mudflat and salt marsh habitats. Construction is scheduled for September 2010.

Since mid-2009, Poseidon and the USFWS have been in discussion regarding restoration of the Otay River Floodplain Subarea of the South San Diego Bay Unit. The USFWS has expressed interest in Poseidon restoring this portion of the wildlife refuge and has agreed to enter into a Memorandum of Understanding with Poseidon to develop detailed plans for restoration of this site.

Status of Environmental Documentation. A joint CCP/EIS for the overall restoration of the entire San Diego Bay National Wildlife Refuge was adopted in 2006. Supplemental environmental documentation pursuant to the western pond restoration project is currently being prepared. Preparation of an environmental document for restoration of the Otay River floodplain has not yet been initiated.

Status of Required Permits. The following permits will be required for the restoration of the South San Diego Bay Unit prior to project approval and implementation:

- U.S. Army Corps of Engineers Section 404 permit and Rivers and Harbors Act Section 10 permit;
- U.S. Fish and Wildlife Service Section 7 Endangered Species Act consultation;
- NOAA National Marine Fisheries Service Consultation pursuant to the Magnuson-Stevens Fishery Conservation and Management Act;
- U.S. Department of the Navy approval to alter Navy-owned land;
- Regional Water Quality Control Board Section 401 Water Quality Certification, and possibly, a waste discharge permit for breaching salt pond levees;;
- California Department of Fish and Game Streambed Alteration Agreement;



Figure 1-2
Location of the San Diego Bay National Wildlife Refuge

Source: California Spatial Information Library, Tele Atlas, USFWS

Carlsbad Field Office - 2003
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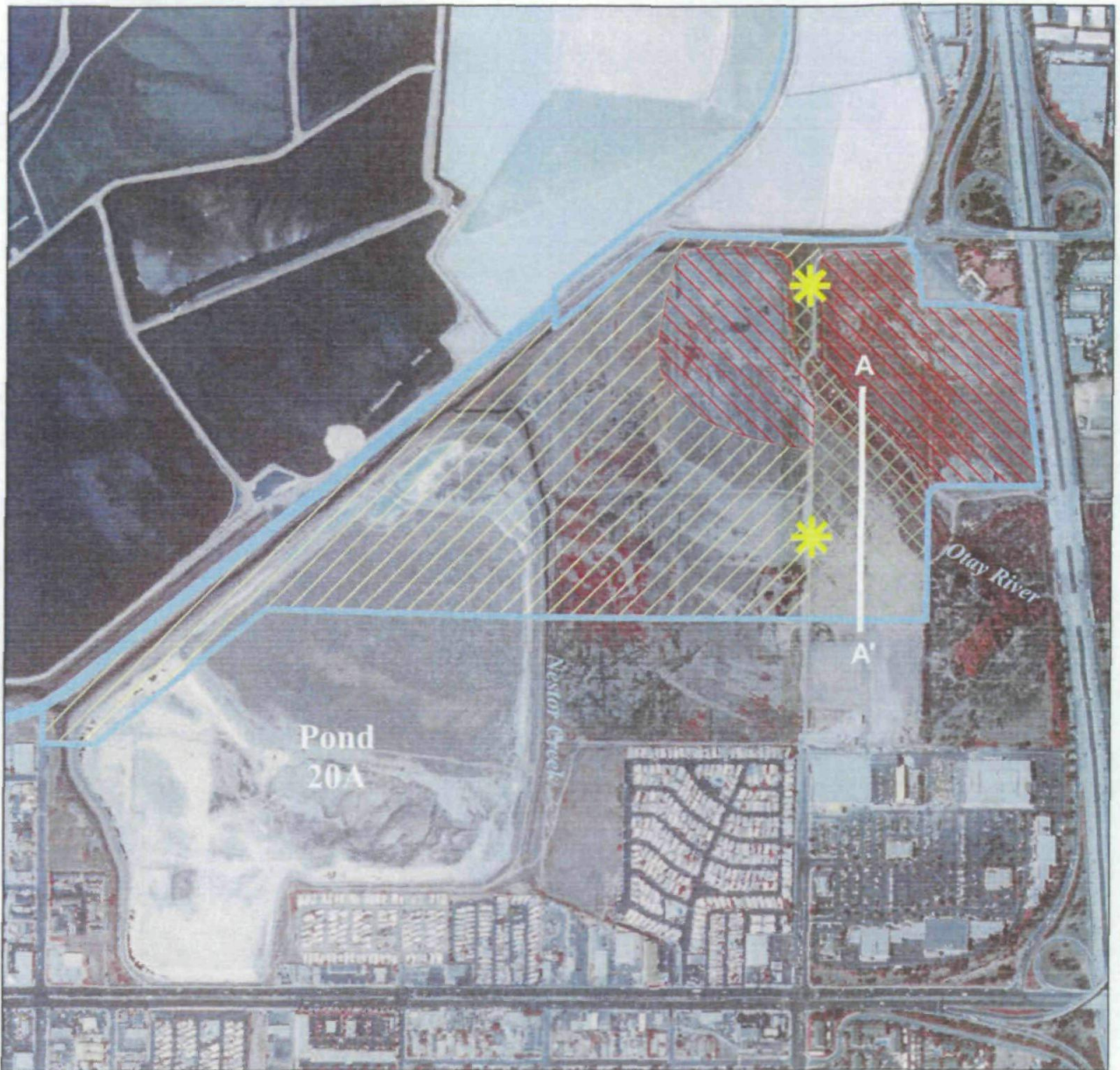





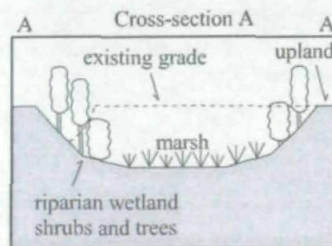


Figure 2-11
South San Diego Bay Unit, Alternative C - Otay River Floodplain Restoration Option 2

-  Refuge management boundary
-  Freshwater wetland (70% marsh and 30% riparian)
-  50% intertidal mudflat, 30% cordgrass, 20% pickleweed
-  Restored uplands
-  Transition from freshwater wetland to salt marsh



0.25 0 0.25 Miles

Carlsbad Field Office - 2003
 /stem/stacey/ssdbay/fig_4-03/habfigures.apr

Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

- California Coastal Commission Concurrence with the USFWS Consistency Determination for the CCP;
- Caltrans District 11 Encroachment permit for potential impacts to Interstate 5;
- San Diego County Air Pollution Control District compliance with Rule 1501 of the Air Pollution Control District's Rules and Regulations;
- City of San Diego Encroachment Permit for any impacts to lands owned by the City of San Diego.

A similar suite of permits will be required for the now-funded western pond restoration. To date, these permits have not been acquired. Similarly, a number of discretionary permits will be required for the potential restoration of the Otay River floodplain by Poseidon. This potential restoration project is in the early planning stages and the required discretionary permits have not yet been identified.

Habitat Distribution.

Long-term Restoration at San Diego Bay National Wildlife Refuge. The CCP/EIS identified conceptual-level restoration for both the Sweetwater Marsh and South San Diego Bay Units. The approximately 21 acres of tidal wetland restoration at the Sweetwater Marsh Unit do not specify habitat distribution (e.g., subtidal and low marsh habitats) other than a minimum of 10 acres must be low marsh. Habitat acreages restored under the preferred alternative for the long-term restoration of South San Diego Bay Unit are presented in Table 3.

Table 3. Overall San Diego Bay Wildlife Refuge and Western Ponds Restoration. Habitat Distribution

Habitats Created (acres)	Overall Restoration Plan	Western Ponds Restoration Component.
Shallow Subtidal	44	25.5
Intertidal Mudflat	124	15.8
Low Salt Marsh	447	129.4
Mid-high Salt Marsh	32	52.6
Total	647	223.3

Restoration of Ponds 10a, 10 and 11 (western ponds). The western pond restoration is the first phase of the overall San Diego Bay Wildlife refuge restoration program. The habitat acreages to be created by the USFWS under the currently-funded western salt ponds restoration are presented in Table 3. These acreages are conceptual and may change following the development of final engineering plans.

Otay River Floodplain. The USFWS prepared two alternatives for restoration of the Otay River Floodplain Subarea. The habitat acreages that would be created by both alternatives are presented in Table 4. These acreages are conceptual and may change following the development of final engineering plans by Poseidon or the USFWS.

Table 4. Habitat Acreages for the Otay River Floodplain Restoration Options – USFWS 2006.

Restoration Option	Habitat Type (acres)					Uplands
	Tidally-influenced Wetlands			Freshwater Wetlands		
	Mudflat (50%)	Cordgrass (30%)	Pickleweed (20%)	Marsh	Riparian	
Option 1	31	19	13	6	13	61
Option 2	44	26	18	12	5	38

Potential Impacts to Existing Habitats.

According to the CCP/EIS, creation of intertidal wetlands at the Otay River Floodplain would impact up to 6 acres of intertidal habitat, 3 acres of freshwater marsh and up to 130 acres of uplands, primarily old agricultural fields. However, a refined restoration plan may reduce those anticipated impacts.

Land Ownership The approximately 2,300-acre South San Diego Bay Unit, including the Otay River Floodplain Subarea, is leased to the USFWS by the State Lands Commission.

Ease of Compliance with California Coastal Commission Objectives and Criteria. Selection of the San Diego Wildlife Refuge as a mitigation site holds potential for compliance with CCC objectives and goals. The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant populations nesting gull-billed terns, and continentally significant populations of surf scoters, Caspian terns and western snowy plovers. The entire southern end of San Diego Bay has been recognized as a Western Hemisphere Shorebird Reserve Network Site. Given that the CCC criteria are likely to include very stringent success criteria for bird species, the use of this area by significant populations of wetland bird species is beneficial in meeting those criteria.

The South Bay’s shallow subtidal habitat also supports a group of twelve species of fish that are indigenous to the bays and estuaries of the Southern California Bight. The extensive shallow water habitat and eelgrass beds of the South Bay provide important habitat for these and a variety of other fish, including midwater, schooling fishes, such as northern anchovies, slough anchovies, and topsmelt. These species, in turn, represent a major forage resource for predatory fish and avian species. The warmer, hypersaline waters of the South Bay also offer shelter for a number of fish species commonly encountered further south in the Eastern Subtropical and Tropical Pacific. The south end of San Diego Bay also appears to function as an important nursery area for juvenile California halibut and young spotted and barred sand bass. Thus, compliance with objectives regarding fish populations appears to be attainable.

Restoration of the Otay River Floodplain Subarea to intertidal wetlands would restore areas that were formerly mapped as intertidal mudflats and salt marsh (1852 U.S. Coast Survey map and 1859 Survey of the Coast of the United States, Coastal Survey Office). Thus, the potential for successful restoration is high.

SAN DIEGUITO LAGOON

Wetland restoration planning at San Dieguito Lagoon has been on-going since the late 1970s when the City of Del Mar and the Coastal Conservancy prepared a plan for revitalizing and managing the lagoon and surrounding areas. As a result of that effort, the City of Del Mar adopted the San Dieguito Lagoon Resource Enhancement Program in 1979. In 1983, a portion of the enhancement plan was implemented with dredging of a 70-acre tidal lagoon. In the 1991, the Coastal Commission adopted new operating conditions for the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 operated by Southern California Edison (SCE). These conditions required SCE to restore 150 acres of tidal wetlands as mitigation for impacts to the marine environment from operation of SONGS units 2 and 3. The Coastal Commission identified eight potential wetland mitigation sites, including San Dieguito Lagoon, as potential mitigation sites, ultimately selecting San Dieguito Lagoon in 1992. In 2000, the San Dieguito Wetland Restoration EIR/EIS was completed. That document was based on the final Coastal Commission conditions that SCE submit a plan for a total of 150 acres of credit, including creation or substantial restoration of 115 acres of tidal wetland with up to 35 acres credit for perpetual maintenance of the tidal inlet of the lagoon. SCE began construction of the restoration project in 2006.

In 2007, Poseidon Resources identified San Dieguito Lagoon as a potential site to mitigate for impacts to the marine environment from the proposed operation of its Carlsbad Desalination Plant in Carlsbad, California. Conceptual plans for approximately 42 acres of tidal wetland creation were developed and submitted to the Coastal Commission pursuant to Poseidon's application for a Coastal Development Permit (see project location and figure 2 of the mitigation plan).

Despite developing a conceptual restoration plan, Poseidon ultimately rejected the San Dieguito Lagoon restoration site following unsuccessful negotiations with SCE. The San Dieguito River Park JPA has adopted a Memorandum of Understanding with Caltrans District 11 and SANDAG for restoration of the property.

Status of Existing Plans. The San Dieguito Lagoon Wetland Restoration Plan Element of the Marine Life Mitigation Plan for the Carlsbad Desalination Plant, Carlsbad, California was prepared for Poseidon Resources in July 2008 (Nordby Biological Consulting et al. July, 2008). The wetland restoration plan included restoration of approximately 42 acres of tidal wetland that would have been biologically and hydraulically linked to the San Dieguito Wetland Restoration currently being constructed by SCE. Poseidon has abandoned plans to implement the restoration plan following unsuccessful negotiations with SCE.

Status of Environmental Documentation. The need for a project-specific EIR was been identified; however, due to the conceptual nature of the wetland restoration plan and the uncertainty of the project, preparation of the EIR has not been initiated.



San Dieguito Lagoon

2006 Aerial

File Name: c:\2007\proj\2007-0000_0000.mxd
Date: 11/14/07
Source: Aerial - Resolution: 24 300



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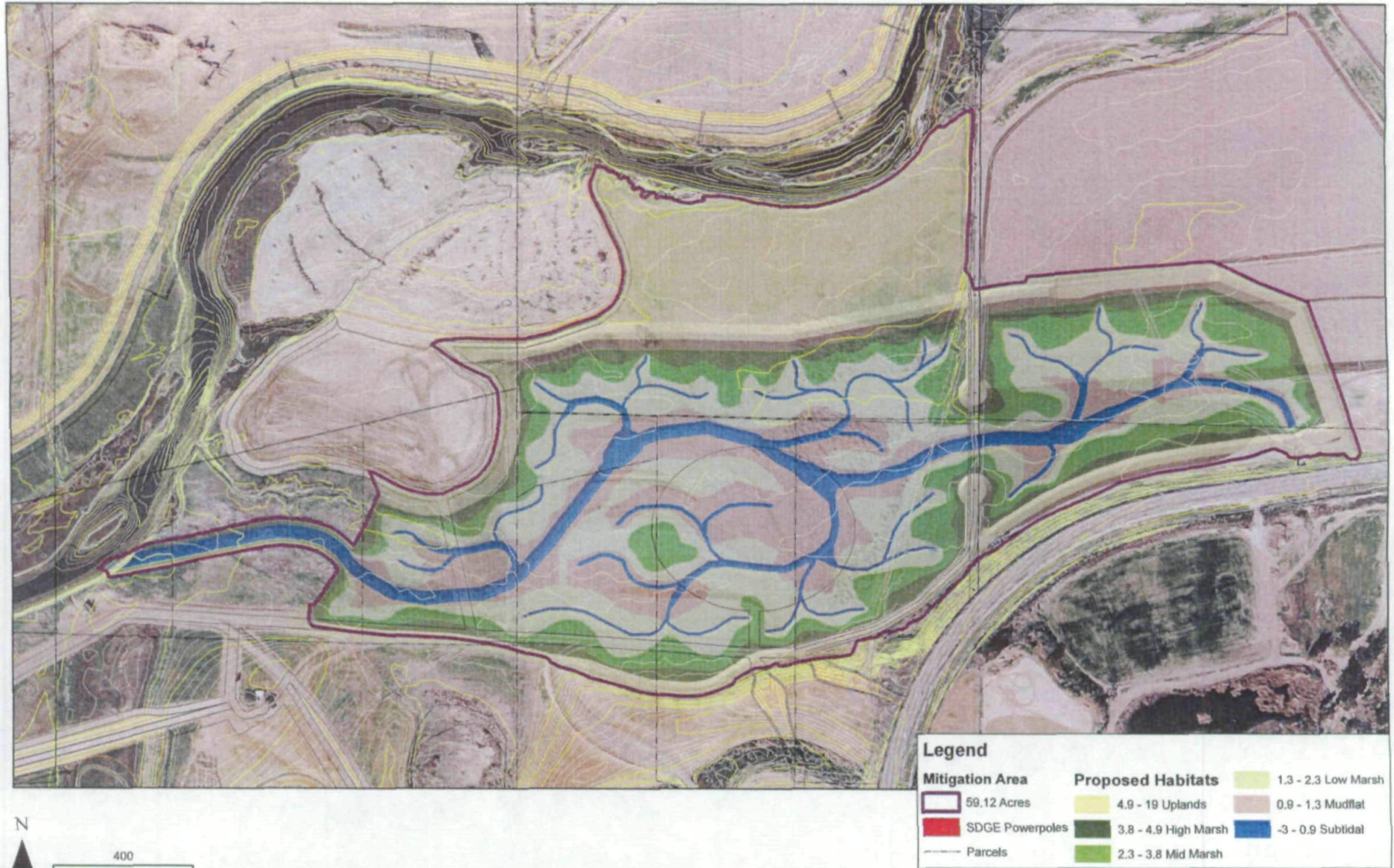


Figure 2: Habitats Created by Proposed Mitigation Plan

Status of Required Permits. The following permits will be required prior to project approval and implementation:

- City of San Diego Site Development Permit
- U.S. Army Corps of Engineers Section 404 permit;
- Regional Water Quality Control Board Section 401 Water Quality Certification;
- California Department of Fish and Game Streambed Alteration Agreement;
- California Coastal Commission Coastal Development Permit;
- U.S. Fish and Wildlife Service Section 7 Federal Endangered Species Act Consultation.
- San Diego County Air Pollution Control District dredge operation permit.

Due to the conceptual nature of the wetland restoration plan and the uncertainty of the project, no applications for permits have been submitted.

Habitat Distribution. The 2008 restoration plan would result in the creation of approximately 42 acres of tidally-influenced coastal wetland habitat. All created wetland habitats would be below 4.9 feet NGVD, the estimated Mean Higher High Water level. The following habitats would be created:

- Subtidal (-3 to -0.9 feet NGVD) - 2.5 acres;
- Mudflat (-0.9 to +1.3 feet NGVD) – 14.4 acres;
- Low marsh (+1.3 to +2.3 feet NGVD) – 12.0 acres;
- Mid-marsh (+2.3 to +3.8 feet NGVD) – 7.3 acres;
- High Marsh (+3.8 to +4.9 feet NGVD) – 5.3 acres;

Potential Impacts to Existing Habitats. The proposed project would result in minimal impacts to existing biological resources. These include:

- 0.06 acre of *Sarcocornia pacifica*-dominated wetland at the point of hydraulic connection to the San Dieguito River;
- 0.12 acre of fresh/brackish marsh associated with a man-made drainage channel.

Land Ownership. The area proposed for the 42-acre restoration, as well as an additional 22 acres needed to convey flood flows, is owned by the San Dieguito River Park Joint Powers Authority (JPA). The JPA was a potential partner with Poseidon on the proposed restoration project; however, SCE asserted prior rights to the property, thereby rendering the project infeasible. Currently, the JPA is a partner with Caltrans District 11 and SANDAG for restoration of the site.

Ease of Compliance with California Coastal Commission Objectives and Criteria. The potential for successful wetland restoration at the San Dieguito Lagoon site identified by Poseidon is dependent upon the success of the SCE restoration. The two projects would be physically linked, with the 42-acre site essentially an extension of the SCE site. Failure by SCE to provide the requisite tidal flushing through maintenance of the tidal inlet or failure to excavate or maintain the proposed elevations would negatively affect both restorations and ultimately prevent achievement of the stringent Coastal Commission success criteria.

AQUA HEDIONDA LAGOON

Aqua Hedionda Lagoon is located in the City of Carlsbad at the terminus of Aqua Hedionda and Macario creeks (see project location figure). The majority of the lagoon is owned and maintained by Cabrillo Power II, which operates the 900-megawatt Encina Power Station located on the outer basin of the lagoon. The lagoon was created in the early 1950s to provide the Encina plant with seawater for cooling. Poseidon's Carlsbad Desalination Plant (CDP) is located at Aqua Hedionda Lagoon with the intent of using Encina cooling water for desalination while Encina continues to operate.

The entire 400-acre lagoon was completely dredged in 1998-1999 to an average depth of 8 - 11 feet. An extensive eelgrass planting program was initiated after dredging. The City of Carlsbad regulates boating on portions of the inner lagoon, the YMCA operates a canoeing center, and two aquaculture facilities operate on the outer lagoon basin – a white seabass research facility managed by Hubbs/Seaworld and the CDFG, and a commercial mussel aquaculture farm. In 2000, CDFG acquired 186 acres at the eastern end of the lagoon, designated as an Ecological Reserve. The non-profit Aqua Hedionda Lagoon Foundation was founded in 1990 to help conserve, restore and enhance the resources of the lagoon.

In August 2007, Poseidon developed a Request for Expressions of Interest which was sent to a number of organizations associated with the Carlsbad Watershed Network in an attempt to identify mitigation opportunities for the CDP at Aqua Hedionda Lagoon. Three proposals were received as presented below.

1. Expansion of the Aqua Hedionda Lagoon Ecological Reserve. This project includes the acquisition and preservation of land north of the existing Ecological Reserve, primarily upland habitat.
2. Eradication of Invasive Exotic Plants and Restoration with Native Vegetation. This project was proposed by the Aqua Hedionda Lagoon Foundation.
3. Aqua Hedionda Lagoon Abalone Stock Enhancement. This project proposed creation of a 100,000 abalone stock at the Carlsbad Aquafarm and use of this stock to replenish abalone populations near the lagoon.

It was determined that none of the proposed projects meet the goals and objectives of the Coastal Commission, i.e., restoration of 66 intertidal wetland habitats. On May 1, 2008, the Coastal Commission convened a day-long meeting at the Aqua Hedionda Lagoon Foundation Discovery Center that included participants from the California Department of Fish and Game, the Regional Water Quality Control Board, Caltrans, the State Lands Commission, and the cities of Carlsbad and Vista. The purpose was to identify opportunities for wetland restoration in Aqua Hedionda Lagoon that could serve as mitigation for the Carlsbad Desalination Plant. This effort failed to identify any suitable mitigation opportunities within the lagoon.

Status of Existing Plans. Currently there are no restoration plans that meet the goals and objectives of the Coastal Commission.



Aqua Hedionda Lagoon

Status of Supporting Studies. Not applicable.

Status of Environmental Documentation. None.

Status of Required Permits. None.

Habitat Distribution. Not applicable.

Potential Impacts to Existing Habitats. Not applicable.

Land Ownership. CDFG owns the 186-acre Ecological Reserve. Cabrillo Power II owns the remainder of the lagoon.

Ease of Compliance with California Coastal Commission Objectives and Criteria. Currently, there are no restoration plans that meet the goals and objectives of the Coastal Commission.

SAN ELIJO LAGOON

Restoration planning at San Elijo Lagoon has been on-going in various forms for many years. In 1996, the San Elijo Lagoon Area Enhancement Plan was prepared by the San Diego County Department of Parks and Recreation. In 1998, the San Elijo Lagoon Action Plan was prepared by the San Elijo Lagoon Conservancy. In 2001, a restoration assessment of three alternatives was undertaken. The San Elijo Lagoon Inlet Relocation Plan (Coastal Environmental 2001) examined restoration, including the infrastructure improvements, required to implement three alternative restoration projects. In 2006, the U.S. Army Corps of Engineers prepared the San Elijo Lagoon Optimization Study which included detailed analysis of a selected restoration for the lagoon. This plan was rejected by the resource agencies for not providing analysis of restoration alternatives to the selected restoration plan.

Recently (October 2009) SANDAG and the Coastal Conservancy co-funded the San Elijo Lagoon Restoration Project EIR. Project alternatives are being developed for engineering and environmental analysis.

Status of Existing Plans. Thus, there is currently no accepted plan for restoration at San Elijo Lagoon. Project alternatives are under development pursuant to the San Elijo Lagoon Restoration Project EIR. These are presented in the figures below.

Status of Environmental Documentation. A project EIR is in the initial stages of development projected for completion in 2011.

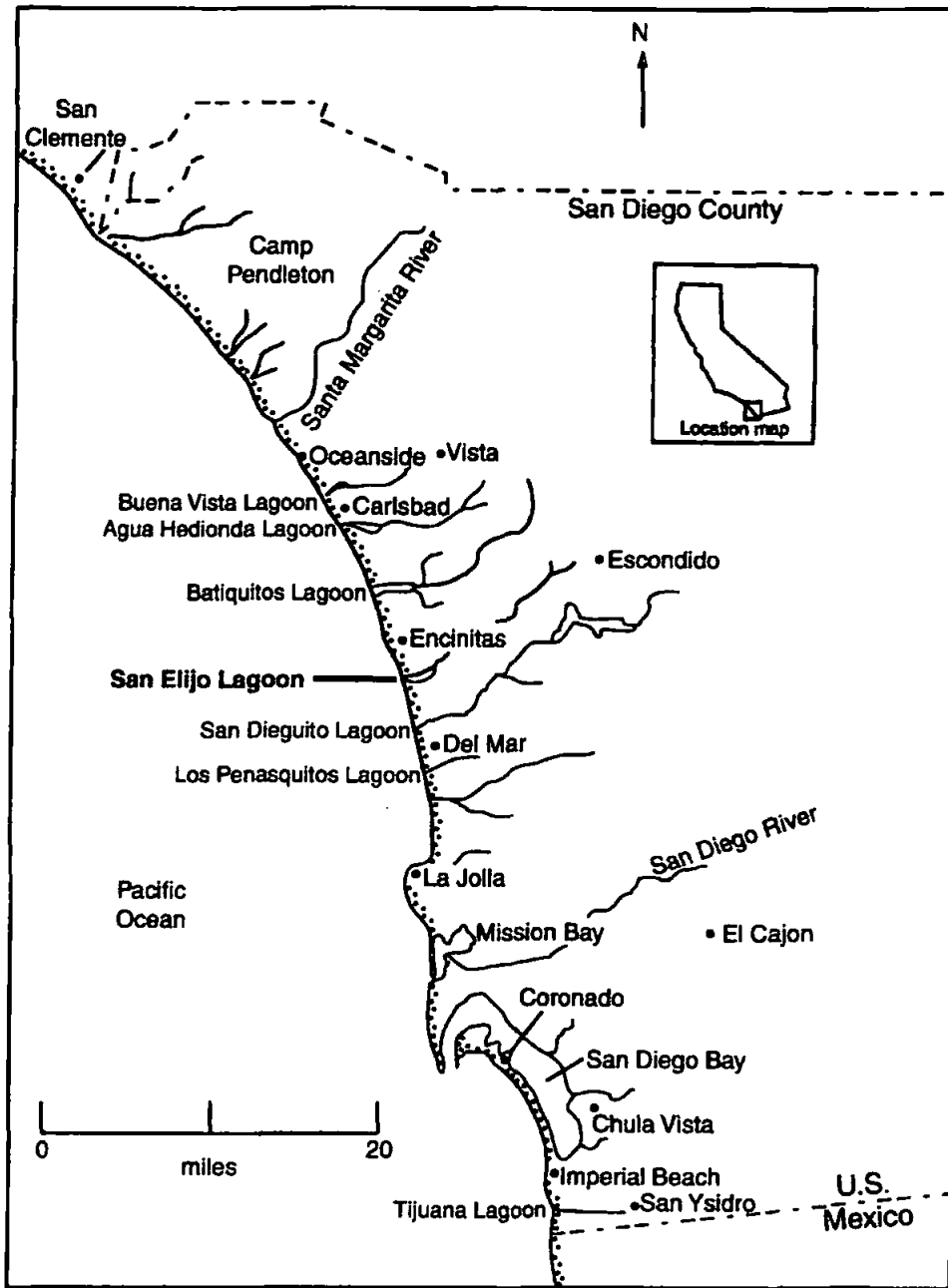


Figure 1-1. Location map of San Elijo Lagoon.

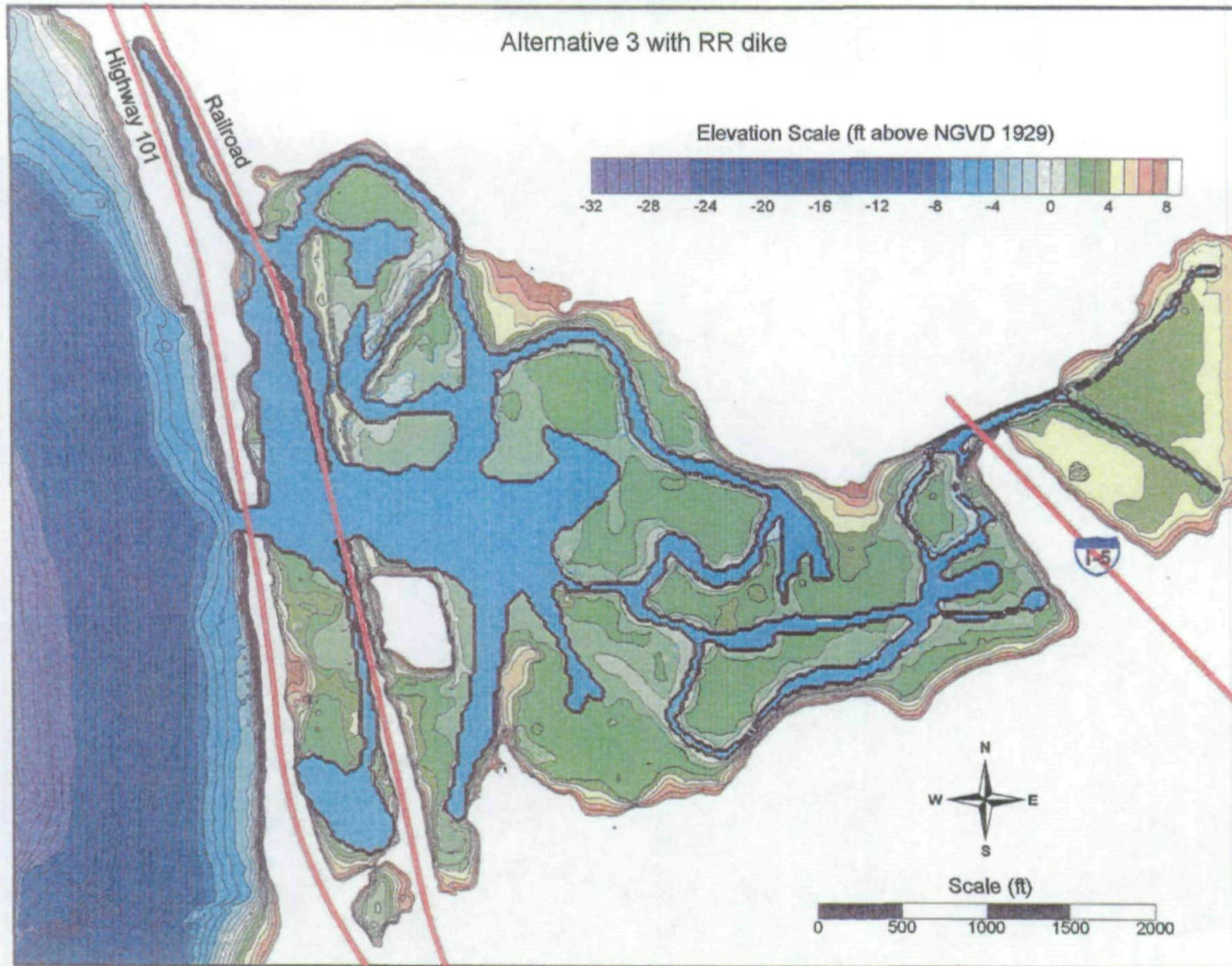


Figure B-5. Lagoon bathymetry after dredging for lagoon inlet Alternative 3 with railroad berm left in place.



Figure B-6. Lagoon bathymetry after dredging for lagoon inlet Alternative 3 with railroad berm removed.

Status of Required Permits. Nine permits were identified in the 2001 restoration plan. Given the developmental stage of the project EIR, no action has been taken on these permits which include:

- San Diego Regional Water Quality Control Board Section - 401 Water Quality Certification,
- California Coastal Commission Coastal Development Permit;
- California State Lands Commission Application for Lease of State Lands;
- California Department of Fish and Game Streambed Alteration Agreement;
- U. S. Army Corps of Engineers – Sections 10 and 404 permits
- U.S. Fish and Wildlife Service Section 7 Consultation
- U.S. Environmental Protection Agency Concurrence with NEPA 404 Integration Process;
- U.S. National Marine Fisheries Service Concurrence with NEPA 404 Integration Process;
- State Historic Preservation Office compliance with Section 106 of the National Historic Preservation Act.

Habitat Distribution and Potential Impacts to Existing Habitats. The project EIR is currently in the developmental stages and final habitat distributions and associated impacts are not yet available.

Land Ownership. The CDFG and San Diego County Parks and Recreation Department are the primary land owners, but several small parcels remain in private ownership.

Ease of Compliance with California Coastal Commission Objectives and Criteria. San Elijo Lagoon, with its current inlet location and configuration, is periodically closed to regular tidal inundation and requires mechanical removal of sand and cobble. In order to ensure regular tidal flushing, the inlet must be moved or reconfigured in its existing location. Without such actions, the mouth will continue to close periodically, resulting in the need for continued maintenance. The inlet is currently constricted by the railroad which crosses the lagoon on an approximately 3,600-foot-long earthen berm. In order to increase tidal flushing to the west, central and east basins, either a portion of the berm must be removed and replaced with a bridge built on pilings, or several large-diameter culverts must be installed in the berm. Currently, the lagoon is very shallow and is filled with sediment accumulated from the watershed. Restoration of shallow subtidal area will require dredging and disposal of this sediment, much of which is unsuitable for ocean disposal and would require upland disposal. The uncertainty of dredge disposal and continuing sedimentation from upstream sources makes compliance with the specific CCC objectives and criteria uncertain. To date, there is no accepted plan for restoration. There is currently no projected time frame for implementing restoration.

BUENA VISTA LAGOON

Buena Vista Lagoon is located between the cities of Oceanside and Carlsbad in San Diego County. The lagoon is comprised of four basins as a result of road and railroad crossings. Constriction of tidal flows associated with these crossings in conjunction with increased sedimentation from upstream sources and decreased water quality has resulted in a degraded freshwater lagoon. A concrete weir built across the ocean inlet in 1972 controls the minimum water level in the lagoon.

The problem of accelerated sedimentation in the lagoon was acknowledged as early as the 1970s. In 1982, the Coastal Conservancy initiated a sediment control program in the lagoon's watershed. In 1983, a Joint Powers Committee, consisting of the cities of Oceanside, Carlsbad and Vista was established and a project to excavate sediment from the eastern end of the lagoon was undertaken. The Southern California Wetland Recovery Project funded the Buena Vista Lagoon Restoration Feasibility Analysis which was completed in 2004 (Everest International Consultants, 2004). The restoration feasibility analysis identified three primary restoration alternatives: the Freshwater Alternative; the Salt Water Alternative; and, the Mixed Water Alternative (see figures 1-1 and 5-3 of the feasibility analysis).

Status of Existing Plans. A restoration feasibility study was completed March 2004 with funding from the Coastal Conservancy. Three restoration alternatives were identified that would result in a range of restored tidal wetlands from 0 to 180 acres.

Status of Environmental Documentation. In 2007, the USFWS and CDFG issued a Notice of Intent to prepare an EIS. The Salt Water alternative was identified as the preferred alternative and the Freshwater Alternative and Mixed Water Alternative were identified as alternatives considered but rejected. A contractor was selected and work on the EIS was initiated; however, work on that document was halted and there is currently no environmental documentation for the proposed restoration.

Status of Required Permits. The following permits will be required prior to project approval and implementation

- U.S. Army Corps of Engineers Section 404 permit;
- U.S. Fish and Wildlife Service Section 7 Consultation;
- Regional Water Quality Control Board Section 401 Water Quality Certification;
- California Department of Fish and Game Streambed Alteration Agreement;
- California Coastal Commission Coastal Development Permit;
- San Diego County Air Pollution Control District dredge operation permit.

Due to the conceptual nature of the restoration feasibility plan, no applications for permits have been submitted.

Habitat Distribution. Due to the conceptual nature of the feasibility analysis, the individual habitats created under each alternative were not delineated. Rather, the hydrologic regime (freshwater, salt water, mixed water) of each alternative was evaluated.



Figure 1.1 Project Location



Figure 5.3 Habitat Distribution for the Mixed Water Alternative (Alternative 3) with Hydraulic Connection Scenario 2

Potential Impacts to Existing Habitats. The Freshwater Alternative would impact approximately 91 acres of freshwater wetlands and open water and associated soft bottom habitats. The Salt Water Alternative would impact approximately 226 acres of similar habitat. The Mixed Water Alternative would impact approximately 148 acres of open water, freshwater marsh and associated soft bottom habitat.

Land Ownership. The majority of the lagoon is owned and managed by the California Department of Fish and Game. However, various municipalities and private in-holdings complicate the restoration potential.

Ease of Compliance with California Coastal Commission Objectives and Criteria. The feasibility study completed in 2004 does not identify a preferred alternative, even on a conceptual basis of fresh water habitats versus salt water habitats. In the NOI for preparing the EIS, the USFWS and CDFG identified the Salt Water Alternative as the preferred alternative. However, preparation of the document was halted. Thus, the uncertainty associated with the preferred restoration alternative compromises the ability to comply with the requirements of the CCC. Two of the alternatives – the Freshwater Alternative and the Mixed Water Alternative – would not comply with the CCC requirements that tidally wetlands be created as mitigation. None of the alternatives comply with the Coastal Commission requirement that Poseidon's mitigation not impact existing wetlands. With the competing interests of public, resource agencies and other stakeholders, a preferred alternative may not be selected within the time frame set forth in the MLMP. Restoration of Buena Vista Lagoon will require dredging and disposal of millions of cubic yards of material, much of which will require upland disposal. Infrastructure in the form of road and railroad bridges will have to be modified to increase tidal influence to basins east of the ocean inlet. The restoration alternatives do not identify phasing where discrete units of restoration could be implemented. Thus, in its current form, the feasibility study is not likely to meet CCC criteria and objectives. As presented previously, the Regional Water Quality Control Board's approval of the MLMP required that Poseidon consider only wetlands located in San Diego County as potential mitigation sites. Restoration opportunities outside of San Diego County cannot be considered unless all opportunities within the county are determined to be infeasible. In accordance with the MLMP approved by the Coastal Commission prior to approval by the RWQCB, restoration opportunities at wetlands located in Orange, Los Angeles and Ventura counties are presented below.

HUNTINGTON BEACH WETLANDS

Wetland restoration planning at Huntington Beach Wetlands began in the mid-1980s with the inception of the Huntington Beach Wetlands Conservancy (HBWC). The HBWC and the California State Coastal Conservancy collaborated on the restoration of the 27-acre Talbert Marsh, a portion of the Huntington Beach Wetlands, in 1990. In 2005, a report entitled Development and Analysis of Restoration Alternatives was prepared for the HBWC and Coastal Conservancy (Moffatt & Nichol et al. 2005). In 2006, the same authors produced the Huntington Beach Wetlands Conceptual Restoration Plan that identified the preferred restoration plan. A Mitigated Negative Declaration for HBWC-owned lands was prepared

pursuant to CEQA in December 2007 and was adopted by the County of Orange in January 2008.

Huntington Beach Wetlands consist of Talbert Marsh (27 acre), Brookhurst Marsh (67 acres), Magnolia Marsh, including Upper Marsh (43 acres), and Newland Marsh (54 acres). As stated previously, Talbert Marsh was restored in 1990, although there has been some sediment deposition issues at the restored marsh, which is located at immediately east of the mouth of the Santa Ana River and is connected to the ocean via Talbert Ocean Channel. Talbert Ocean Channel is a manmade tidal inlet protected by armored jetties. Brookhurst Marsh was restored in 2008. The Magnolia Marsh component of Huntington Beach Wetlands is currently under construction (December 2009). Newland Marsh is the only component of the system that has not been restored. Newland Marsh is owned by the California Department of Transportation (Caltrans) and is not currently available for restoration by another entity; however, for the purposes of this analysis Newland Marsh is considered a potential site for Poseidon's mitigation requirements.

Status of Existing Plans. A conceptual restoration plan was completed April 10, 2006. A preferred restoration alternative was identified that included a total of 191 acres with approximately 54 acres of muted tidal wetlands planned for Newland Marsh see figures 1 and 3 of the conceptual restoration).

Status of Environmental Documentation. A Mitigated Negative Declaration for all HBWC-owned lands was prepared by the County of Orange in December 2007 and was adopted in January 2008. This MND did not include Newland Marsh, which is owned by Caltrans.

Status of Required Permits. Eight permits were identified in the conceptual restoration plan:

- City of Huntington Beach – Coastal Development Permit
- County of Orange Flood Control Agency - Encroachment Permit
- Regional Water Quality Control Board Section - 401 Water Quality Certification, Dewatering Permit;
- California Department of Parks and Recreation Encroachment Permit;
- California Coastal Commission Coastal Development Permit;
- California State Lands Commission Encroachment Permit;
- California Department of Fish and Game Streambed Alteration Agreement;
- U. S. Army Corps of Engineers – Sections 10 and 404 permits

All permits for restoration of HBWC-owned lands had been obtained at the time of the preparation of this document.

Figure 1 – Project Location Map



<p>Huntington Beach Wetlands Conceptual Restoration Plan – Final Report</p>	<p>Project Location Map</p>	<p>Figure 1</p>
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Figure 3 – The Proposed Project



Figure 3

The Proposed Project

Huntington Beach Wetlands Conceptual Restoration Plan Revised Final Report

Habitat Distribution. The distribution of habitats in the restored Newland Marsh is presented in Table 5.

Table 5. Existing and Proposed Conditions, Newland Marsh, Huntington Beach Wetlands, 2006.

Habitat Type	Existing Habitats (acres)	Proposed Habitats (acres)
Shallow Subtidal	10.0	10.7
Mudflat	0.0	6.1
Low Salt Marsh	0.0	5.4
Mid Salt Marsh	18.9	20.6
High Salt Marsh	0.0	3.3
Non-tidal Wetlands	20.6	0.0
Uplands	4.7	8.0
Total	54.2	54.2

Potential Impacts to Existing Habitats. The conceptual plan developed for Newland Marsh would require installing culverts to provide muted tidal influence, enlarging existing channels and creating new channels, and installing protective levees. Creating and enlarging channels would impact an undetermined area of existing non-tidal wetlands.

Land Ownership. Newland Marsh is owned by Caltrans.

Ease of Compliance with California Coastal Commission Objectives and Criteria. The Huntington Beach Wetlands, including Newland Marsh, are linear remnants of a formerly more extensive wetland area. They are bounded to the west by the Pacific Coast Highway and are crossed by surface streets. Thus, the wetlands are fragmented into the respective marsh components. Restoration of linear fragments of degraded wetlands may not meet the stringent standards imposed by the Coastal Commission. Furthermore, only muted tidal action will be introduced to Newland Marsh such that higher high tides and lower low tides will not be conveyed through the culverts. Muted tidal influence is suboptimal for wetland restoration.

The restoration will disturb existing non-tidal wetland habitat. Thus, Coastal Commission objectives and criteria requiring no impacts to existing wetlands are not achievable. The site is owned by Caltrans and is not currently available for restoration by other entities.

ANAHEIM BAY

Anaheim Bay is located within the city limits of Seal Beach and Huntington Beach in Orange County. There are approximately 956 acres of wetland habitats associated with the Bay, nearly all of them contained within Seal Beach National Wildlife Refuge located within the boundaries of the Seal Beach Naval Weapons Station (see aerial photograph). Approximately 740 acres of the Wildlife Refuge are subject to regular, unobstructed tidal influence, including 565 acres of salt marsh, 60 acres of intertidal mudflats, and 115 acres of tidal channels and open water. In 1990, approximately 116 acres of wetlands adjacent to the Seal Beach National Wildlife Refuge were restored at Anaheim Bay as mitigation for impacts associated with construction of a 147-acre landfill at the Port of Long Beach.



Seal Beach National Wildlife Refuge in Anaheim Bay.

In 2007, the U.S. Fish and Wildlife Service (USFWS) published a Notice of Intent to prepare a Comprehensive Conservation Plan (CCP) for the refuge. The CCP is intended to act as a “blueprint” for management of the Refuge over the next 15 years. In August 2008, the USFWS published an update on the CCP. That update presented three draft alternatives for the CCP:

- Alternative A – No Action;
- Alternative B – Maximum Salt Marsh Restoration, Continue Current Public Use Program;
- Alternative C – Optimize Upland and Wetland Restoration, Improve Opportunities for Wildlife Observation (Preferred Alternative).

Under Alternative C, the preferred alternative, approximately 10 acres of coastal sage scrub habitat, 15 acres of wetland/upland transition habitat, and 8 acres of salt marsh would be restored. The selection of Alternative C as the preferred alternative is considered a draft decision, subject to a final decision during public review of the draft document.

Status of Existing Plans. Not available, pending completion of the CCP.

Status of Supporting Studies. Not available, pending completion of the CCP.

Status of Environmental Documentation. Not available. The CCP will be prepared as a joint CCP/Environmental Assessment (EA) pursuant to the national Environmental Protection Act (NEPA).

Status of Required Permits. Not available.

Habitat Distribution: Under the draft CCP, 10 acres of coastal sage scrub habitat, 15 acres of wetland/upland transition habitat, and 8 acres of salt marsh would be restored.

Potential Impacts to Existing Habitats. Not available.

Land Ownership. U.S. Navy.

Ease of Compliance with California Coastal Commission Objectives and Criteria.

The preferred alternative of the CCP includes restoration of approximately 8 acres of salt marsh, although it is not specified whether this restoration will be tidal or non-tidal. Regardless, restoration of 8 acres is not sufficient to meet Poseidon’s mitigation requirements.

SANTA ANA RIVER

The Santa Ana River wetlands are located south of the Huntington Beach Wetlands across the Santa Ana River mouth. The area consists of approximately 170 acres of wetlands situated in four main sites within the greater Santa Ana River wetlands complex. It is estimated that the historic acreage of wetlands at the mouth of the river was 2,900 acres. The site has been degraded by agriculture, oil extraction activities and other human uses.

In 1987, the Marsh Restoration, Lower Santa Ana River Channel, Orange County, California (Simon Li & Associates 1987) was prepared for the U.S. Army Corps of Engineers (USACOE), Los Angeles District. The restoration plan identified three alternative restoration scenarios for a 92-acre portion of the wetlands owned by the USACOE. The restoration was subsequently implemented in 1989 as mitigation for biological impacts associated with the Lower Santa Ana River Improvement Project (see figure 1 of the restoration plan). In 1991, Orange County adopted an enhancement plan for South Talbert and Fairview/North Talbert parks, renamed Talbert Nature Preserve in 1995. In 1991, the Orange County Environmental Management Agency (OCEMA) developed a draft Local Coastal Plan (LCP) for restoration on land owned by Mobile Oil. OCEMA did complete processing of the LCP.

There have been no official wetland restoration plans formulated for the Santa Ana River Mouth wetlands since the 1990s. Any restoration activity at this site would require extensive study, land acquisition and infrastructure removal (primarily oil extraction infrastructure).

Status of Existing Plans. No current plan available.

Status of Environmental Documentation. Not available.

Status of Required Permits. Not available.

Habitat Distribution. Not available.

Potential Impacts to Existing Habitats. Not available.

Land Ownership. Restorable wetlands located to the north and east of the 92-acre restored site owned by Newport Oil Company.

Ease of Compliance with California Coastal Commission Objectives and Criteria. Given that there are no existing plans to restore additional habitat at the Santa Ana River mouth, compliance with CCC objectives and criteria cannot be evaluated at this time.

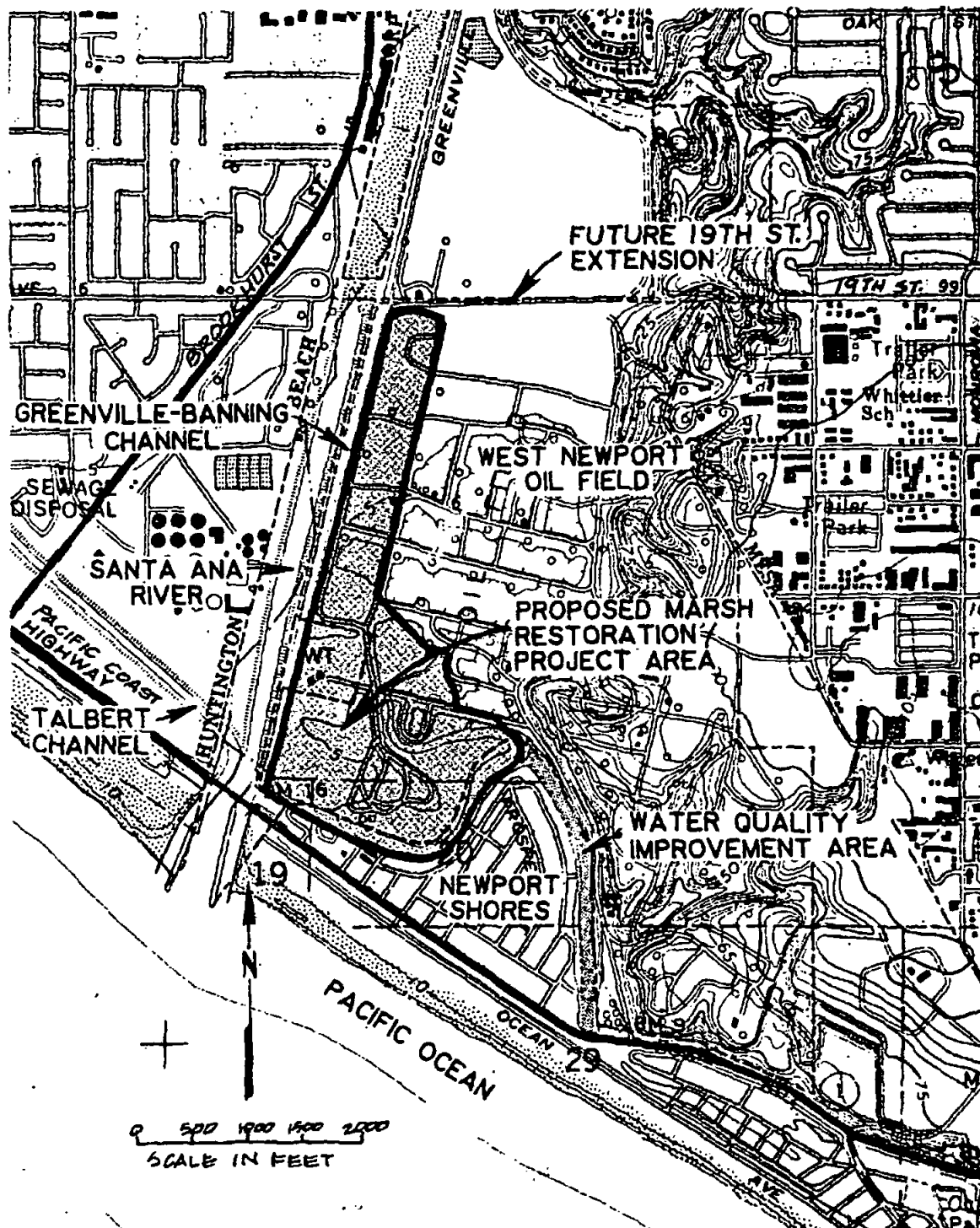


Figure 1 Project Vicinity

LOS CERRITOS WETLANDS

Los Cerritos Wetlands is a degraded relic wetland area flanking the lower San Gabriel River in Los Angeles County. A number of stakeholders have been involved with restoration planning of these wetlands. In 2006, a joint powers agreement was adopted to form the Los Cerritos Wetlands Authority (LCWA). This JPA consists of the City of Long Beach, the City of Seal Beach, Rivers and Mountains Conservancy, and the California State Coastal Conservancy. In 2005, a conceptual restoration plan for approximately 496 acres was prepared by Moffat & Nichol for California Earth Corps, a local stakeholder. The restoration plan includes primarily conceptual-level engineering and hydrology, but does not include analysis of biological resources or other resources.

Status of Existing Plans. A conceptual level restoration plan was prepared for approximately 496 acres. The conceptual restoration plan identifies three phases: Phase I (171.9 acres); Phase II (137 acres); and Phase 3 (187.2 acres) (see figures 1 and 5 of the conceptual restoration plan).

Status of Environmental Documentation. No Environmental Documentation is available. A CEQA document, presumably an EIR, would be required at the state level. Federal funding may require an analogous NEPA document.

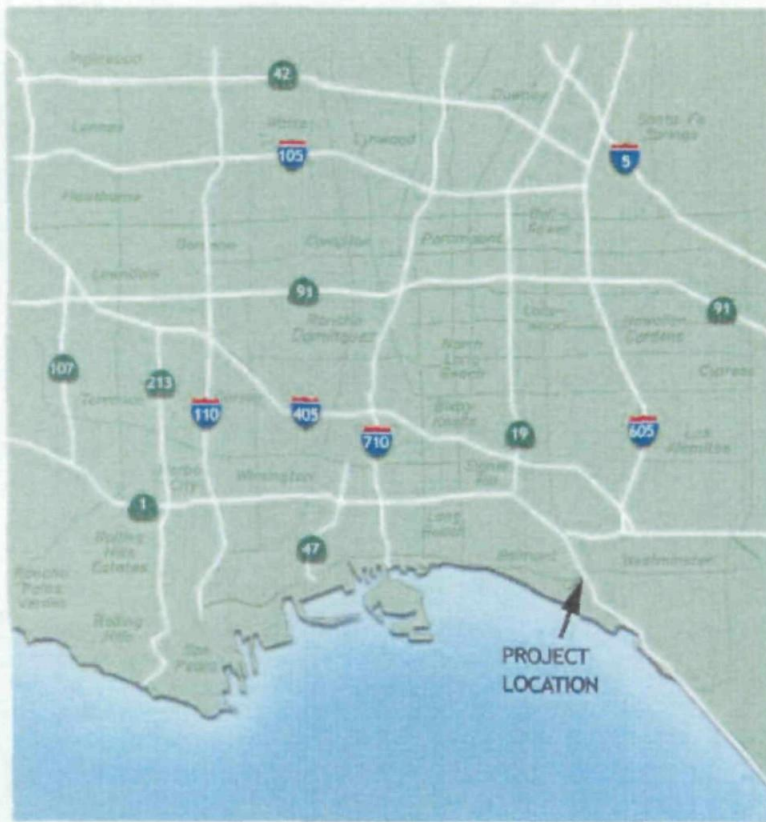
Status of Required Permits. The permits required for restoration were not identified in the conceptual restoration plan. Permit requirements would be similar to those identified for Ormond Beach.

Habitat Distribution. The conceptual plan does not specify acreages of habitats to be created. Of the approximately 496 acres included in the restoration plan, potentially 25% (124 acres) would be restored as subtidal habitat; 55% (273 acres) as intertidal wetlands; and 20% (99) acres a supratidal habitat located above the mean high tide line. However, these numbers are conceptual only.

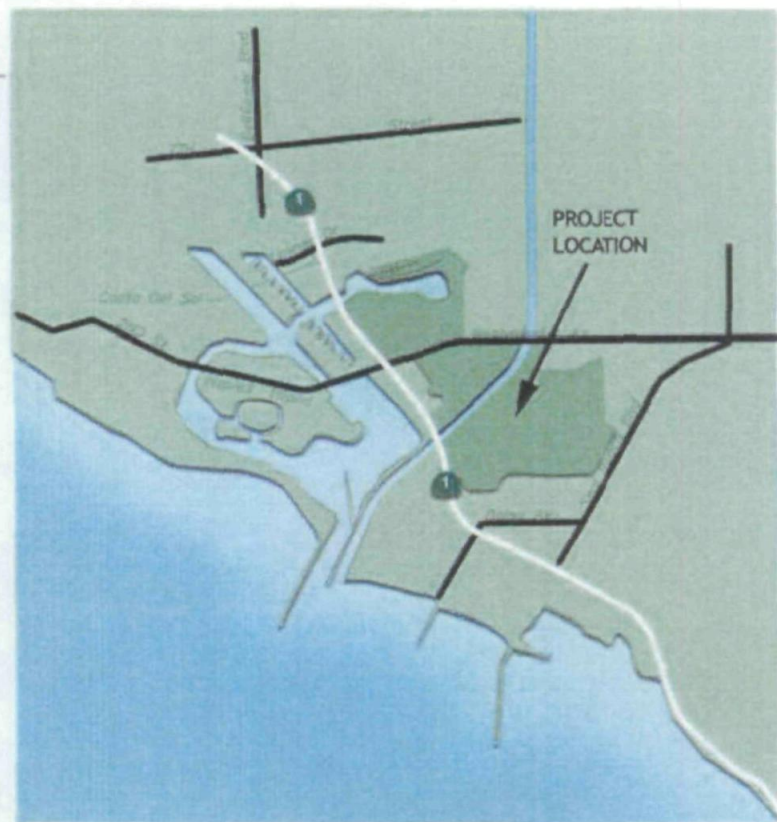
Land Ownership. Land ownership at Los Cerritos Wetlands is complicated and has been an impediment to a unified restoration strategy. The conceptual restoration plan identifies the following owners of the 496-acre planning area:

- 193 acres owned by Hellman Partners;
- 193 acres owned by Bixby Company ;
- 67 acres owned by Ernest Bryant;
- 38 acres owned by County of Orange;
- 5 acres owned by Los Alamitos Partners.

In 2006, the LCWA purchased the 67 acres owned by Ernest Bixby. On November 12, 2008, the Los Angeles (LA) Times reported that this land had been traded in a land swap to the City of Long Beach. The article quoted City of Long Beach officials as stating that this area would be set aside for restoration. On November 17, 2009, the LA Times reported that, through continued negotiations, the amount of land offered as a land swap had been reduced;



VICINITY MAP
NTS



LOCATION MAP
NTS

Figure 1 – Project Location

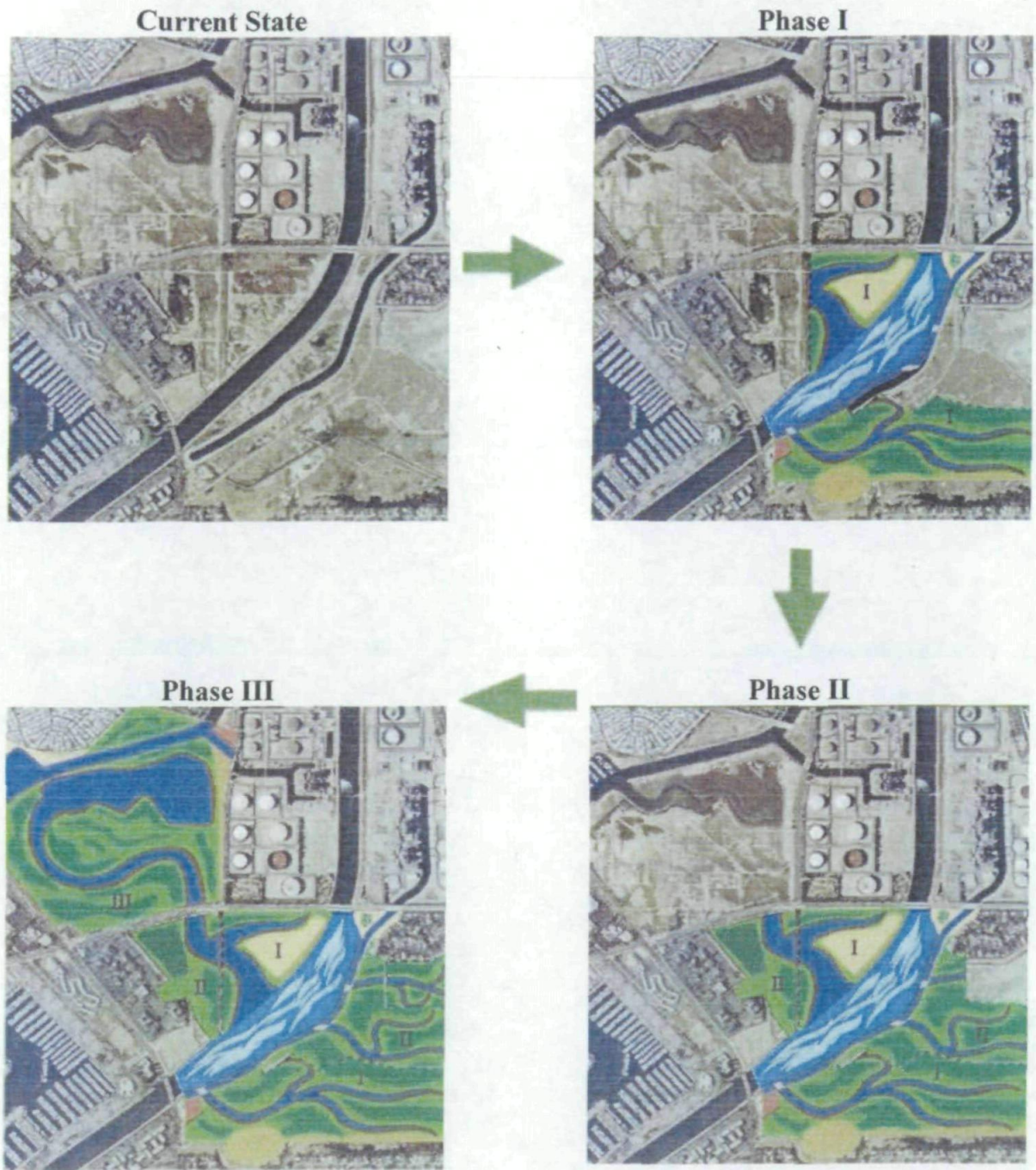


Figure 5. Los Cerritos Wetlands Conceptual Restoration Plan.

first to 52 acres, then to 38 acres, and that very high levels of PCBs had been detected within that 38-acre parcel. The presence of high levels of PCBs jeopardizes any restoration plans for this site.

Ease of Compliance with California Coastal Commission Objectives and Criteria. The presence of high levels of PCBs in at least a portion of Los Cerritos Wetlands reflects the uncertainty regarding eventual restoration of this site. Any proposed restoration would require extensive testing for contaminants, as well as planning, engineering, environmental documentation and permitting required for such projects. In addition to PCBs, the site has been impacted from oil extraction activities and the source of seawater for the existing remnant wetlands, Los Cerritos Channel, is used by two power plants for once-through cooling. The elevated water temperature associated with once-through cooling of existing power plants may influence the establishment of target habitats and the assemblage of species required by the CCC.

BALLONA WETLANDS

Ballona Wetlands, located south of Playa del Rey, is the last major wetland remaining in Los Angeles County (see figure 1-1). Efforts to preserve and restore this wetland have spanned approximately the last 30 years and have included the efforts of a host of non-profit organizations, state and federal resource agencies and other stakeholders. The project site includes about 600 acres owned by the State of California. In 2004, the Department of Fish and Game took title to approximately 540 acres of former wetlands. The State Lands Commission owns approximately 60 acres of created freshwater marsh and muted tidal salt marsh.

It is estimated that Ballona Wetlands once occupied more than 2,000 acres at the mouth of Ballona Creek. In the 1930s, Ballona Creek was channelized by the U.S. Army Corps of Engineers and Los Angeles Flood Control District. In the 1950s, construction of Marina del Rey converted coastal wetland and dunes into a marina. Dredge spoils from marina construction were deposited on undeveloped portions of Ballona Wetlands, raising the elevation and altering the soils of the site. Major infrastructure, including Jefferson, Culver and Lincoln boulevards, and electricity, water and gas utility lines transect the former wetlands, with significant impacts to hydrologic and habitat connectivity.

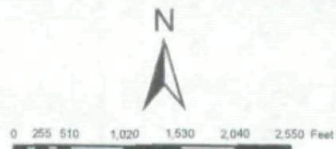
In 2005, the California State Coastal Conservancy funded the Ballona Wetlands Restoration Feasibility Study (PWA et al., 2008). This study culminated in the development of five restoration scenarios, ranging from minimal wetland creation and enhanced upland restoration to maximum wetland restoration that includes the removal of Ballona Creek Flood Control Channel and significant infrastructure modification.



figure 1-1

*Ballona Wetlands Restoration
Project Area*

Proj. # 1793



Status of Existing Plans. A restoration feasibility study was completed September 2008 with funding from the Coastal Conservancy. Five alternative restoration plans were developed for further consideration, including:

- Enhance existing habitat with minimal grading;
- Muted tidal wetland restoration within existing constraints;
- Full tidal wetland restoration, supporting all associated habitat types and requiring significant site alteration;
- Full tidal wetland and subtidal habitat restoration, providing a connection between these habitats with the project site, and requiring significant site alteration;
- Realignment of Ballona Creek, allowing interaction between the creek and wetland, and providing much more habitat and functional connectivity; and, requiring significant site alteration.

Status of Environmental Documentation. The need for a project specific EIR has been identified. In late 2009, the Coastal Conservancy selected a contractor to prepare the EIR for the project, anticipated to begin early 2010.

Status of Required Permits. The following permits will be required prior to project approval and implementation:

- U.S. Army Corps of Engineers Section 404 permit;
- Regional Water Quality Control Board Section 401 Water Quality Certification;
- California Department of Fish and Game Streambed Alteration Agreement;
- California Coastal Commission Coastal Development Permit;
- California State lands Commission Encroachment Permit;
- Los Angeles County Air Pollution Control District dredge operation permit.

To date, there has been no action regarding acquisition of the identified permits. Two alternatives were selected for further analysis in the project EIR (see figs 2-7 and 2-9 of the feasibility study).

Habitat Distribution and Potential Impacts to Existing Habitats. The proposed habitat distribution for each of the five restoration alternatives is presented in Table 6. Impacts to existing habitats have not been analyzed to date. In general, alternatives 3-5 propose to create fully tidal estuarine habitat with a resultant loss of fresh water marsh/ riparian and upland habitats.





Table 6. Summary of Habitat Acreages by Alternative, Ballona Wetlands, 2009.

Habitat Type	Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Subtidal	74.0	74.0	74.0	74.0	115.4	48.6
Intertidal Channel and Mudflat	1.7	10.4	11.7	20.4	40.6	26.2
Low Marsh	8.5*	66.0 (64.7*)	66.3 (37.0*)	102.0	87.6	131.0
Mid Marsh	17.6*	35.1 (34.3*)	38.6 (19.6*)	66.3	58.4	85.2
High Marsh	40.6*	18.6 (17.8*)	29.2 (10.2*)	66.3	58.4	85.2
Transitional Habitat	0.0	31.9	81.1	123.5	95.2	96.1
Brackish marsh	3.0	2.7	2.6	2.6	2.6	2.6
Total Estuarine	167.9	238.7	303.5	455.0	458.2	474.8

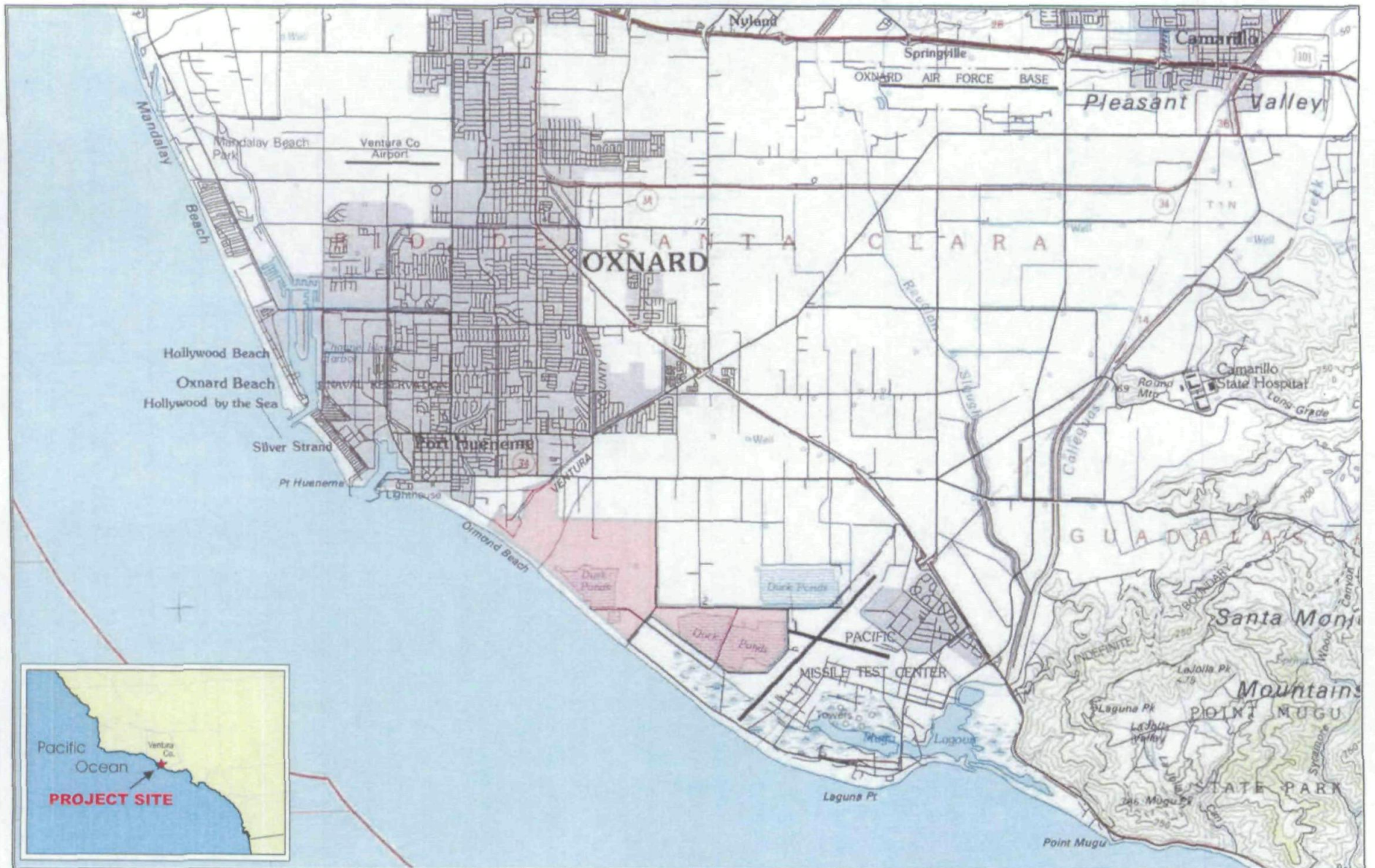
*Area of muted tidal influence

Land Ownership. All potentially restorable land is owned by the State of California.

Ease of Compliance with California Coastal Commission Objectives and Criteria. The feasibility study completed in 2008 does not identify a preferred alternative. Subsequently, two alternatives (4 and 5) were revised and proposed for further analysis in the project EIR. In addition, phasing has been proposed only for Alternative 5, such that compliance with the mitigation requirement of 55 acres of tidal wetlands by the CCC cannot be accomplished without considerable design effort. Currently, the site is dominated by disturbed upland habitats with a small muted tidal marsh and the fully-tidal, concrete-lined Ballona Flood Control Channel. Ballona's potential for restoration is high, as is the potential for eventually supporting the habitats and species required by the CCC. However, the lack of consensus by stakeholders on a restoration strategy suggests that selection of a preferred alternative and further refinement may not occur in the near future. Restoration of Ballona Wetlands will require excavation and disposal of millions of cubic yards of material. Infrastructure in the form of roads and bridges will have to be modified to increase tidal influence under some alternatives.

ORMOND BEACH

The Ormond Beach Restoration Project is a California State Coastal Conservancy-funded project located in Ventura County adjoining the cities of Port Hueneme and Oxnard (see figure I-1). Approximately 1,500 acres of Ormond Beach is undeveloped and includes a mix of degraded wetlands, beach and dunes, agriculture, and mixed industry, including an abandoned metals-processing plant and an existing electricity generating plant. A 560-acre duck club with artificially maintained ponds and remnant intertidal habitat exists to the north of Ormond Beach. The goal of the Ormond Beach Restoration Project is the acquisition of approximately 1,100 acres at Ormond Beach and the 560 acres of the duck club for a total restoration of approximately 1,600 acres.



 Project Area

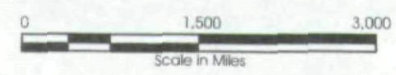


Figure 1-1
Regional Map

To date the Coastal Conservancy has acquired 540 acres at Ormond Beach. Prior to the planned restoration, the Conservancy must acquire 210–340 acres of the Southland Sod Farm. Sale of a portion (210 acres) of this farm has been offered by the owner, contingent upon completion of the City of Oxnard’s Specific Plan for Ormond Beach.

The 50-acre Reliant Power Plant is situated on fill that was formerly coastal lagoon. This parcel divides the proposed restoration in half, obstructing potential hydrologic and biological connectivity. This plant is expected to cease operation within the next five years due to fundamental inefficiencies and adverse effects on marine life caused by its intake and outfall (P. Brand, Coastal Conservancy).

The 40-acre Halaco metals processing facility also occupies former coastal lagoon. The goal of the restoration plan is to acquire the Halaco property and restore the former wetlands after the EPA has remediated this Superfund site.

The acquisition of the Ventura County Duck Club is contingent upon the member owners being allowed to continue hunting on apportion of the 560-acre site. (P. Brand, Coastal Conservancy).

Status of Existing Plans. The Ormond Beach Restoration Feasibility Study, funded by the Coastal Conservancy, was completed in October 2009. Six possible alternatives for habitat restoration, enhancement and creation were identified, as well as a No Project Alternative.

Overall, the alternatives include three concepts: 1) creation of a new lagoon with a permanent ocean inlet (Alternative 1); 2) restoration of the project area’s historic wetland habitat mosaic with intermittently open inlets and seasonal ponds (Alternative 2); and 3) enhancement of existing habitats with minimal hydrologic and ground surface modifications (Alternative 3). Due to uncertainties regarding potential land acquisitions, two variants were developed for each alternative. The “unconstrained” alternatives assume that the Coastal Conservancy and its partners will be able to secure all of the candidate properties identified for the project. The “constrained” alternatives assume that some candidate properties will not be available in the foreseeable future. As such, the Feasibility Study identifies a maximum “project area” of 1,730 acres for unconstrained alternatives, and approximately 770-790 acres of constrained alternatives. Project alternatives are presented below:

Alternative 1 Unconstrained (Alternative 1U): Create New Tidal Lagoon;

Alternative 1 Constrained (Alternative 1C): Create New Tidal Lagoon;

Alternative 2 Unconstrained (Alternative 2U): Restore Seasonally Open Wetland Habitats/Ponds;

Alternative 2 Constrained (Alternative 2C): Restore Seasonally Open Wetland Habitats/Ponds;

Alternative 3 Unconstrained (Alternative 3U): Enhance Existing Non-tidal Wetlands Habitats;

Alternative 3 Constrained (Alternative 3C): Enhance Existing Non-tidal Wetlands Habitats.

These alternatives are considered preliminary and subject to further refinement. No preferred alternative was identified in the Feasibility Study. Alternative U1 is presented as an example of project alternatives (see figure 6-1 of the feasibility study).

Status of Environmental Documentation. No Environmental Documentation currently exists. The need for a project-specific EIR, as well as other high priority planning issues, has been identified. The EIR and other project analyses are pending.

Status of Required Permits. Not available. It is anticipated that discretionary permits typically associated with coastal wetland restoration projects will be required, including but not limited to:

- U.S. Army Corps of Engineers Section 404 permit;
- Regional Water Quality Control Board Section 401 Water Quality Certification;
- California Department of Fish and Game Streambed Alteration Agreement;
- California Coastal Commission Coastal Development Permit;

Habitat Distribution and Potential Impacts to Existing Habitats. The Feasibility Study presents a complex and, admittedly, incomplete analysis of potential habitats to be created and habitats potentially impacted. These ultimately depend upon proposed habitat acquisitions and final planning. The Feasibility Study presents a breakdown of the restored, created or enhanced habitat types by alternative. Fifteen upland and wetland habitat types are identified and quantified. Creation, restoration and enhancement of intertidal wetlands, such as those required of Poseidon for mitigation, range from 437 acres (Alternative 1U) to 0 acres (Alternative 3C).

Land Ownership. See above.

Ease of Compliance with California Coastal Commission Objectives and Criteria. It is difficult to assess the potential for the Ormond Beach Restoration Plan to comply with Coastal Commission objectives and criteria given the level of information that is currently available. However, from the information presented in the Feasibility Study, it appears that the Coastal Commission requirement of creation/restoration of fully-tidal wetlands with a full complement of species and habitats found at reference wetlands may be difficult to achieve within the prescribed time period. As stated previously, no preferred alternative was presented in the Feasibility Study. The Feasibility Study identifies 30 short-term and long-term recommendations for further analysis required to refine the plan. The complexity of the project and associated land acquisitions suggests a long-term restoration approach. While this approach may be financially and ecologically sound, short-term restoration success as required of Poseidon by the Coastal Commission does not appear to be achievable. Furthermore, the project includes acquisition and remediation of an active Superfund site, a process that often takes a number of years and imposes unknown risks to restoration success.



RANKING OF POTENTIAL MITIGATION SITES

Each potential wetland mitigation site was evaluated based on its ability to meet California Coastal Commission objectives and criteria and the imposed timeline, i.e. presentation of a *final mitigation plan within 2 years*. Not all of the categories presented in the description of each wetland were used in the ranking evaluation. For example, habitat distribution was not used in the ranking as some plans are conceptual and do not discuss habitat distribution in detail. Other plans are more specific but may present habitat distribution for the overall restoration compared to phased approaches that could provide discrete mitigation units. In addition, status of required permits was not used as none of the potential restoration sites is in the permit acquisition phase. Each site was ranked based on the following criteria:

- Status of the restoration plan;
- Status of environmental documentation;
- Land ownership;
- Ease of compliance with CCC objectives and criteria; and,
- Risk to Poseidon.

Status of Restoration Plan. The restoration plans summarized above exist at varying levels of completion. The more complete the restoration plan, the less time is required for refinement and implementation. The most complete plans are those that have been subjected to a feasibility-level analysis, although there is some variation in the content of a feasibility analysis. Most feasibility-level assessments have included preliminary design and engineering, land acquisition planning and impact assessment. Examples of feasibility-level analyses include Tijuana Estuary, San Dieguito Lagoon, Buena Vista Lagoon, Ballona Wetlands and Ormond Beach wetlands. The Otay River Floodplain Subarea of the San Diego Bay National Wildlife Refuge (SDBNWR), while lacking preliminary engineering plans, does include land acquisition, sediment disposal scenarios and impact assessment.

Less complete plans include "conceptual" plans which are often no more than pictures of potential restoration scenarios which lack preliminary engineering, or land acquisition. Examples include San Elijo Lagoon, Anaheim Bay, Santa Ana River mouth, and Los Cerritos Wetlands.

Some of the wetlands presented above lack even conceptual plans and are included in this assessment because they have been identified as having the potential for some as of yet unidentified restoration. Aqua Hedionda Lagoon currently lacks conceptual level restoration planning.

Status of Environmental Documentation. Typically, an EIR or EIS requires approximately 12 - 16 months to complete and adopt. Thus, those wetlands with well developed restoration plans or a programmatic level EIR or EIS would rank highest for this evaluation criterion. Only the SDBNWR restoration plans are included in a certified environmental document. The SDBNWR CCP/EIS is a programmatic document requiring project-specific supplemental CEQA, and possibly NEPA, documents.

Land Ownership. Restoration plans that require complex property acquisition present an uncertainty in terms of time frame and final restoration plan. In many cases, property acquisition attempts have been on-going for many years and remain uncertain. Several restoration sites are located on land owned by the State of California (see Ranking Table). San Dieguito Lagoon site is owned by the San Dieguito River Park JPA. Ormond Beach wetlands represent the greatest challenge in terms of land acquisition with much of the area included in the restoration plan currently in private ownership.

Ease of Compliance with CCC Objectives and Criteria. Use of this criterion to rank potential mitigation sites is somewhat subjective, but important to this analysis. It is not possible to predict with complete certainty the outcome of any wetland restoration at any site. The restoration requirements of the CCC are extremely rigorous and may not be achievable by any restoring any of the 12 sites considered here. Thus, each wetland was given a score of either "Unknown", "Moderate" or "Difficult" for this criterion, as there are no restoration plans that could be considered to easily meet these standards.

Any restoration plan that is conceptual, or is based on land acquisition and passive restoration, was determined to be "Unknown" or "Difficult" in terms of meeting the CCC mitigation criteria of November 14, 2008. Restoration sites that may be capable of meeting the CCC standards are rated as "Moderate" for this category. Four restoration sites received the score of moderate including: Ballona Wetlands, San Dieguito Lagoon, San Diego Bay National Wildlife Refuge, and Tijuana Estuary.

Risk to Poseidon. The risk to Poseidon from selecting any of the 12 sites as a mitigation site is also somewhat subjective. Like the "Ease of Compliance with CCC Objectives and Criteria" any restoration at any of the 12 sites analyzed confers some risk. A site was considered to be of relatively "Low" risk if it included a mix of desired wetland habitat types (e.g., intertidal), restoration would not impact existing wetlands as defined by the CCC, the land was intended for wetland restoration and the plan had a moderate probability of meeting CCC success criteria. A site is considered to be of "High" risk if it depends upon uncertain property acquisition, if the plan is conceptual or out-of-date, if the restoration is passive, if the plan evokes controversy regarding selection of a preferred alternative, or involves reconfiguration/relocation of significant infrastructure, such as bridges, inlet channels, and utilities. A site was considered "Moderate" risk if there was a complete or relatively complete restoration plan, the restoration plan was active and included the appropriate mix of habitat types, land acquisition was not the primary goal, the comparative ease of compliance with CCC goals and criteria was moderate. Based on these criteria, one site scored "Low" – The Otay River Floodplain Subarea of the San Diego Bay National Wildlife Refuge – and two sites scored "Moderate": San Dieguito Lagoon and Tijuana Estuary. Tijuana Estuary scored lower than the SDBNWR due to potential sedimentation issues and impacts to existing wetlands. San Dieguito Lagoon scored lower than SDNWR due to potential ownership issues with SCE.

Ranking. Based on the above criteria, two sites are ranked as Moderate. These include the Otay River Floodplain Subarea of the SDNWR and Tijuana Estuary. Only the San Diego Bay National Wildlife Refuge received a score of "Low" for potential risk to Poseidon. The final ranking of each wetland is presented briefly below and summarized in Table 7.

- **Tijuana Estuary.** Tijuana Estuary also presents a significant opportunity for tidal wetland restoration. The feasibility study recently completed identifies phases that are similar in size to Poseidon's restoration needs. Tijuana Estuary has been identified by CCC contract biologists as a reference site for the SONGS restoration at San Dieguito Lagoon, and has been identified as a reference site for Poseidon's mitigation, once finalized. Thus, the potential for meeting CCC objectives is relatively high. The California State Parks and California State Coastal Conservancy are partners in the proposed restoration; and preparation of a project EIR and permit acquisition may be accomplished within the required timeframe. However, sedimentation problems have not been completely addressed at Tijuana Estuary. Funding for maintenance of the Goat Canyon Sedimentation Basins is uncertain from year-to-year. Without annual removal of sediment from the basins, sediment flows through the basins into adjacent wetlands. Recent construction of the Border Fence project is expected to exacerbate sedimentation in the Tijuana River Valley. Furthermore, as currently planned, restoration will impact degraded wetland habitats and may not meet CCC requirements of Poseidon's mitigation site. This wetland received a ranking of "Moderate" as a potential mitigation site.
- **San Diego Bay National Wildlife Refuge.** The SDBNWR presents significant opportunity for tidal wetland restoration with over 650 acres of tidally-influenced restoration available at the South San Diego Bay Unit. The Otay River Floodplain Subarea provides the opportunity to restore areas that were formerly intertidal mudflats and salt marsh according to historical maps of south San Diego Bay. Thus, the potential for achieving successful restoration is high. Restoration can be accomplished with minimal impact to existing wetlands, i.e., only at the point of hydraulic connection to the Otay River. This wetland received a ranking of "High" as a potential mitigation site. Compliance of this restoration site with Coastal Commission goals and objectives is presented in Appendix A.
- **San Dieguito Lagoon.** Although conceptual in nature, the restoration plan developed by Poseidon for San Dieguito Lagoon has been designed to complement the on-going SONGS restoration at the lagoon. The project has been designed specifically to meet Poseidon's mitigation requirements. The site affords a nearby sediment deposition site and currently includes access to the proposed restoration area. Although a final plan, environmental documents and permits are required, it is possible that these can be finalized within the prescribed timeframe. Poseidon was unable to reach an agreement with Southern California Edison regarding long-term ownership of the restored lands included in Poseidon's plans for this site. As a result, the San Dieguito River Park JPA has entered into a MOU with Caltrans and SANDAG to use the site as mitigation for impacts associated with the widening of Interstate 5. Thus, this wetland is no longer available as a restoration site for Poseidon and received a ranking of "Low".
- **Aqua Hedionda Lagoon.** There are currently no plans for restoration of Aqua Hedionda Lagoon that would meet the requirements of the Coastal Commission. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.

- **San Elijo Lagoon.** Restoration of San Elijo Lagoon will likely entail relocation of the current ocean inlet and associated infrastructure relocation, e.g., railroad and Highway 101 bridges. Development of restoration alternatives is in the initial stages, as is preparation of the project EIR. At present, restoration alternatives include primarily enhancement of existing habitats rather than creation of new wetland habitats. As such, the project will impact existing low quality wetlands in order to create higher quality habitats, i.e., wetlands with greater tidal influence. Such impacts are prohibited by CCC restoration criteria. Currently, restoration plans are being funded by SANDAG as part of a regional restoration effort. SANDAG and Poseidon objectives may be mutually exclusive. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Buena Vista Lagoon.** There is considerable uncertainty associated with the Buena Vista Lagoon restoration. Preparation of the project EIS has been suspended. There appears to be a lack of consensus among stakeholders regarding a preferred alternative. Substantial reconfiguration/relocation of infrastructure would be required. Conversion of one wetland habitat type - existing freshwater wetlands - to salt water wetlands does not satisfy CCC requirements that there be no impacts to existing wetlands. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Anaheim Bay.** The Seal Beach National Wildlife Refuge initiated preparation of a Comprehensive Conservation Plan (CCP) for the refuge in 2007. The preferred alternative identified in the project update in August 2008 included minimal salt marsh restoration and did not specify if this restoration was tidally influenced. As planned, restoration efforts for this wetland do not meet Poseidon's needs. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Santa Ana River Wetlands.** There are currently no restoration plans for the Santa Ana River mouth that can be evaluated in terms of Poseidon's mitigation requirements. At least some of the land is in private ownerships. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Huntington Beach Wetlands.** All of the components of the Huntington Beach Wetlands Restoration plan have been constructed or are in the process of being constructed, with the exception of Newland Marsh. Newland Marsh is approximately 54 acres in area and is owned by Caltrans. While Newland Marsh was included in conceptual level restoration plans, further planning has not been undertaken using public funds. Caltrans may desire to restore Newland Marsh as mitigation for impacts associated with current or future highway projects. Environmental documentation is currently lacking. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Ballona Wetlands.** The Ballona Wetlands restoration plan is in the feasibility stage. Two restoration alternatives were recently selected for further analysis in the project EIR/EIS. Construction phasing that might include an area similar to that needed as mitigation by Poseidon has not been included in the analysis. Both alternatives require some infrastructure improvement/relocation with one alternative requiring large-scale

infrastructure improvements. Preparation of a project EIR/EIS is in the initial stages. Thus, this wetland received a ranking of "Low" as a potential mitigation site for Poseidon.

- **Los Cerritos Wetland.** The Los Cerritos Wetlands restoration plan is conceptual in nature, requires acquisition of property, includes areas contaminated with PCBs and other areas of potential contamination, and requires large-scale infrastructure improvements. Detailed restoration plans and environmental documentation are lacking at this time. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.
- **Ormond Beach.** The feasibility study of the Ormond Beach restoration is complex, requiring acquisition of land from multiple owners. The preferred alternative was not identified in the feasibility study; however, passive restoration/enhancement is proposed in some alternatives and may be the only viable option for some habitats. The restoration site includes an EPA Superfund site (Halaco metals site) which will require remediation. The timeframe for restoration may be measured in decades rather than years which would not meet the CCC timing criterion. Environmental documentation is currently lacking. This wetland received a ranking of "Low" as a potential mitigation site for Poseidon.

Table 7. Ranking of Potential Mitigation Sites

Wetland	Status of Restoration Plan	Status of Environmental Documentation	Land Ownership	Ease of Compliance with CCC Objectives	Risk to Poseidon	Ranking
Tijuana Estuary	Feasibility Study	Needed	California State Parks	Moderate	Moderate	Moderate
San Diego Bay NWR Otay River Floodplain	Conceptual	Programmatic EIS completed	State Lands Commission	Moderate	Low	High
San Dieguito Lagoon	Conceptual	Needed	San Dieguito JPA	Moderate	*Not Applicable	Low
San Elijo Lagoon	Feasibility Study	Needed	State of California	Difficult	High	Low
Buena Vista Lagoon	Feasibility Study	Needed	State of California	Unknown	High	Low
Aqua Hedionda Lagoon	Not applicable	None	Cabrillo Power-CDFG	Non-compliant	High	Low
Anaheim Bay	CCP (in prep)	None	U.S. Navy	Difficult	High	Low
Santa Ana River	None	None	Private	Unknown	High	Low
Huntington Beach Wetlands (Newland Marsh)	Conceptual	Needed	Caltrans	Moderate	*Not Applicable	Low
Ballona Wetlands	Feasibility Study	Needed	State of California	Moderate	High	Low
Los Cerritos Wetlands	Conceptual Plan	Needed	Acquisition	Difficult	High	Low
Ormond Beach	Pending	Needed	Acquisition	Unknown	High	Low

* These wetlands are not currently available to Poseidon as a potential restoration sites.

NA = Not Available

Appendix A

Otay River Floodplain Site Compliance with California Coastal Commission's Goals and Objectives

1.0 PHASED IMPLEMENTATION

Phase I: Poseidon is to provide at least 37 acres of estuarine wetland restoration. Within two years of issuance of the desalination facility's coastal development permit (CDP), Poseidon is to submit a complete CDP application for a proposed restoration project, as described below.

Phase II: Poseidon is to provide an additional 29 acres of estuarine wetland restoration. Within five years of issuance of the Phase I CDP, Poseidon is to submit a complete CDP application proposing up to 29 acres of additional restoration, subject to reduction as described below.

2.0 SITE SELECTION

In consultation with Commission staff, the permittee shall select a wetland restoration site or sites for mitigation in accordance with the following process and terms.

Within 9 months of the effective date of this permit, the permittee shall submit the proposed site(s) and preliminary wetland restoration plan to the Commission for its review and approval or disapproval.

The location of the wetland restoration project(s) shall be within the Southern California Bight. The permittee shall select from sites including, but not limited to, the following eleven sites: Tijuana Estuary in San Diego County; San Dieguito River Valley in San Diego County; Agua Hedionda Lagoon in San Diego County; San Elijo Lagoon in San Diego County; Buena Vista Lagoon in San Diego County; Huntington Beach Wetland in Orange County, Anaheim Bay in Orange County, Santa Ana River in Orange County, Los Cerritos Wetland in Los Angeles County, Ballona Wetland in Los Angeles County, and Ormond Beach in Ventura County. The permittee may also consider any sites that may be recommended by the California Department of Fish & Game as high priority wetlands restoration projects. Other sites proposed by the permittee may be added to this list with the Executive Director's approval.

The basis for the selection shall be an evaluation of the site(s) against the minimum standards and objectives set forth in subsections 3.1 and 3.2 below. The permittee shall take into account and give serious consideration to the advice and recommendations of the Scientific Advisory Panel (SAP) established and convened by the Executive Director pursuant to Condition B.1.0. The permittee shall select the site(s) that meets the minimum standards and best meets the objectives.

3.0 PLAN REQUIREMENTS

In consultation with Commission staff, the permittee shall develop a wetland restoration plan for the wetland site(s) identified through the site selection process. The wetland restoration plan shall meet the minimum standards and incorporate as many as feasible of the objectives in subsections 3.1 and 3.2, respectively.

3.1 Minimum Standards

The wetland restoration project site(s) and preliminary plan(s) must meet the following minimum standards:

- a. Location within Southern California Bight;

The selection of the Otay River Floodplain Subarea of the South San Diego Bay Unit of the San Diego Bay Wildlife Refuge satisfies the requirement that the mitigation site be located within the southern California bight.

- b. Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas;

The Otay River Floodplain Subarea has been proposed for restoration by the U.S. Fish and Wildlife Service (USFWS: San Diego Bay National Wildlife Refuge, Final Comprehensive Conservation Plan [CCP] and EIS 2006). The USFWS proposed two alternative restoration scenarios for the Otay River Floodplain in its 2006 CCP/EIS.

- **Option 1. Restoration Option 1 focused on a balance between restored wetland and restored upland habitats. Under this option, approximately 60 acres of upland habitat would be restored, 60 acres would be restored to intertidal salt marsh and mudflats, and 20 acres would be restored to freshwater wetlands.**
- **Option 2. Restoration Option 2 would restore approximately 90 acres of intertidal salt marsh and mudflat, 35 acres of native uplands and 15 acres of freshwater wetlands.**

Under both USFWS options, intertidal wetlands would be comprised of approximately 50% mudflat, 30% cordgrass (low marsh) and 20% pickleweed (mid-high marsh). Creation of subtidal habitat is also feasible, requiring modification of the conceptual design presented in the CCP/EIS.

Historic maps indicate that the area proposed for restoration was formerly intertidal mudflat and salt marsh that has been filled for agriculture and salt production. Thus, the potential for successful restoration is high.

- c. Creates or substantially restores a minimum of 37 acres and up to at least 66 acres [all locations] acres of habitat similar to the affected habitats in Agua Hedionda Lagoon, excluding buffer zone and upland transition area;

The requirement of restoration of up to 66 acres of habitat similar to that affected at Agua Hedionda Lagoon can be accomplished at the Otay River Floodplain Subarea. Option 2 presented in the CCP/EIS included more than 66 acres of tidally influenced wetlands.

- d. Provides a buffer zone of a size adequate to ensure protection of wetland values, and at least 100 feet wide, as measured from the upland edge of the transition area.

The proposed restoration of the Otay River Floodplain Subarea can provide buffer zones in excess of 100-feet in all directions.

- e. Any existing site contamination problems would be controlled or remediated and would not hinder restoration;

A limited field sampling program was conducted in 1989 that included collection of three surface soil (0.5 - 1 feet below ground surface) samples - two from agricultural fields and one from the former sewage treatment plant oxidation ponds formerly located on-site. All three soil samples were analyzed for chlorinated pesticides while the oxidation pond sample included additional analysis of selected metals.

Dichlorodiphenyltrichloroethane (DDT) and metabolites (dichlorodiphenyldichloroethylene [DDE] and dichlorodipenyldichloroethane [DDD]) and toxaphene were detected in the samples collected from the agricultural fields. Concentrations of total DDT (including metabolites) were 2,200 parts-per-billion (ppb) and 4,050 ppb. Toxaphene was detected at 3,000 and 4,200 ppb. Arsenic, cadmium, chromium, copper, nickel, and lead were detected in the oxidation pond sample. Pesticides were not detected in the oxidation pond sample.

Additional surface soil testing was conducted in 1999 as part of the USFWS pre-acquisition activities. Organochlorine pesticide analyses were performed on 15 samples collected across the property. DDT and its metabolites were the primary pesticides detected. Detected concentrations of DDT ranged between 12 and 1,400 ppb. Detected concentrations of DDE ranged between 22 and 1,200 ppb. DDD was detected at concentrations between 8 and 1,100 ppb. Average detected concentrations for DDT, DDE, and DDD were 349, 503, and 413 ppb, respectively. Endrin aldehyde was the only other detected pesticide with a range of detected concentrations between 15 and 1,400 ppb.

The source of DDT is directly related to the historic use of this property for agricultural production, primarily tomatoes and other truck crops. A sewer treatment plant that operated within the Otay River floodplain between the mid 1950s and the early 1960s is considered the source of the various metals detected in some of soil samples.

On December 21, 2009, Poseidon conducted a screening level soil contaminants assessment in the project area. Four 15-foot-deep soil borings were collected in Pond 20a and four were collected in the former agricultural land adjacent to the Otay River. Only one sample, located near the Otay River, indicated the presence of DDT. Soils within and adjacent to Pond 20a showed little, if any, contamination. Thus, although former agricultural activities have resulted in high levels of DDT and derivatives on a portion of the property, it appears that there are uncontaminated areas that may be suitable for restoration. Further soil testing will be needed to determine the horizontal extent of DDT contamination.

- f. Site preservation is guaranteed in perpetuity (through appropriate public agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use;

The Otay River Floodplain Subarea of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge is owned by the California State Lands Commission and leased to the USFWS exclusively for restoration of coastal wetlands and associated uplands[Both agencies preserve and protect lands for the public. Prior to restoration at the Otay River Floodplain, agreements will be adopted to guarantee preservation of the site in perpetuity.

- g. Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;

The San Diego Bay Wildlife Refuge is managed by the U.S. Fish and Wildlife Service. The USFWS will provide management of the restored wetlands to protect its ecological value in perpetuity.

- h. Does not result in a net loss of existing wetlands; and

The proposed restoration entails the conversion of a former salt evaporation pond and former agricultural lands to intertidal salt marsh, mudflats and subtidal habitats. Only minimal impacts to existing wetlands will occur at the point of hydraulic connection to the Otay River. Thus, the project will not result in a net loss of existing wetlands.

- i. Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.

The CCP and EIS prepared for the project identified all endangered plant and animal species in the project location and the potential impacts associated from implementation of the preferred alternative. In general, the document presents the potential effects to endangered species associated with construction of the habitat restoration and the long-term effects of the habitat restoration. The document concludes that the potential for adverse effects to the Refuge's endangered and threatened species during restoration-related grading activities would be minimized by controlling the level of construction activity permitted in the vicinity of active nest areas, including restricting some activities to the non-breeding season; establishing construction boundaries that minimize impacts to native vegetation and sensitive habitat areas; and monitoring sensitive habitat areas during construction to assess actual disturbance levels and, where necessary, developing and implementing additional protective measures.

The long-term effects on threatened and endangered species of the restored habitats are considered beneficial.

3.2 Objectives

The following objectives represent the factors that will contribute to the overall value of the wetland. The selected site(s) shall be determined to achieve these objectives. These objectives shall also guide preparation of the restoration plan.

- a. Provides maximum overall ecosystem benefits, e.g. maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;

The proposed restoration of the Otay River Floodplain Subarea entails the conversion of a former solar evaporation pond and former agricultural fields to intertidal salt marsh and mudflats and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitat are regionally scarce habitats targeted for restoration/creation in the southern California Bight. Located just upstream of San Diego Bay, the fisheries of the bay would be considered the downstream fishery. The fisheries of South San Diego Bay are recognized as a valuable resource that will be enhanced by the restoration process. The extensive shallow water habitat and eelgrass beds of the South Bay provide important habitat for these and a variety of fish, including midwater, schooling fishes, such as northern anchovies, slough anchovies, and topsmelt. These species, in turn, represent a major forage resource for predatory fish and avian species. The warmer, hypersaline waters of the South Bay also offer shelter for a number of fish species commonly encountered further south in the Eastern Subtropical and Tropical Pacific. The south end of San Diego Bay also functions as an important nursery area for juvenile California halibut and young spotted and barred sand bass.

The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant populations nesting gull-billed terns, and continentally significant populations of surf scoters, Caspian terns and western snowy plovers. The entire southern end of San Diego Bay has been recognized as a Western Hemisphere Shorebird Reserve Network Site. The proposed restoration has been designed to preserve and enhance this biological diversity.

- b. Provides substantial fish habitat compatible with other wetland values at the site(s);

The conversion of the former evaporation pond and agricultural lands to intertidal salt marsh, mudflats and subtidal habitat will provide substantial fish habitat. The role of unvegetated tidal creeks and sloughs as breeding areas and nurseries for estuarine-dependent fishes has been well studied. The transient use of the intertidal salt marsh by species such as California killifish has likewise been demonstrated. These values will all be enhanced by the proposed project. Furthermore, the intertidal mudflats created by the project will provide breeding habitat for the goby species that are prevalent in Agua Hedionda Lagoon..

- c. Provides a buffer zone of an average of at least 300 feet wide, and not less than 100 feet wide, as measured from the upland edge of the transition area.

The Otay River Floodplain Subarea is located in an isolated corner of South San Diego Bay with buffers exceeding 100 feet in all directions.

- d. Provides maximum upland transition areas (in addition to buffer zones);

The proposed restoration is in the initial planning stages; however, there is ample area for incorporating transition zone habitats into the final restoration plan. The conceptual restoration plan presented in the CCP/EIS includes on-site disposal of some excavated soils, pending soil contamination studies. The soil will be used to create upland and transitional habitats.

- e. Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats;

The proposed restoration entails the conversion of a former salt evaporation pond and former agricultural lands to intertidal salt marsh, mudflats and subtidal habitats. Only minimal impacts to existing wetlands will occur at the point of hydraulic connection to the Otay River. The former salt evaporation pond and agricultural lands do not contain functioning wetlands or other sensitive habitats. Thus, the project will not result in impacts to existing wetlands and other sensitive habitats.

- f. Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;

The following goals provided the guiding principles for the South San Diego Bay Unit. They are consistent with USFWS Refuge purposes, National Wildlife Refuge System goals, the NWRIS Improvement Act, USFWS policies, and international treaties. These goals apply to all of the management alternatives evaluated for this Refuge Unit.

Goal 1: Protect, manage, enhance, and restore open water, coastal wetlands, and native upland habitat to benefit the native fish, wildlife, and plant species supported within the South San Diego Bay Unit.

Goal 2: Support recovery and protection efforts for the federally and state listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit.

Goal 3: Provide high quality foraging, resting, and breeding habitat for colonial nesting seabirds, migratory shorebirds and waterfowl, and salt marsh-dependent species.

Goal 4: Provide opportunities for compatible wildlife-dependent recreation and interpretation that foster public appreciation of the unique natural and cultural heritage of South San Diego Bay.

In addition, the CCP was prepared using the following documents as guidance:

- All applicable USFWS threatened and endangered species recovery plans;
- Ecoregion Planning, as defined by the USFWS;
- Shorebird Conservation Planning, as defined by the U.S. Shorebird Conservation Plan;
- Waterbird Conservation, as defined by the North American Waterbird Conservation Plan;
- National Strategy for Coastal Restoration, as defined by Restore America's Estuaries and the National Oceanic and Atmospheric Administration
- Marine Protected Areas, as defined by Executive Order 13158;
- California Wildlife: Conservation Challenges, California's Wildlife Action Plan, as defined by the California department of Fish and Game; and,
- Regional restoration needs

g. Restoration design is that most likely to produce and support wetland-dependent resources;

As stated above, the major goals of the proposed restoration is to protect, manage, enhance and restore open water, coastal wetlands and native upland to benefit native fish, wildlife and plant species supported within the refuge unit and to provide habitat for salt-marsh dependent species. The project has been designed to achieve the objective of producing and supporting wetland-dependent species.

h. Provides rare or endangered species habitat;

Goal 2, stated above, addresses the recovery and protection efforts for the federally and state listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit. The over-arching reason for the establishment of the South Bay unit was the preservation and recovery of threatened and endangered species, including the light-footed clapper rail, the California least tern and salt marsh bird's beak. The preferred restoration plan provides a diverse assemblage of wetland habitats, including cordgrass-dominated salt marsh – the preferred nesting and foraging habitat of the light-footed clapper rail - fishery resources that support the California least tern, and shallow subtidal habitat that provides nursery grounds for California halibut.

i. Provides for restoration of reproductively isolated populations of native California species;

As stated above, one of the primary reasons for acquiring the South San Diego Bay Unit was to preserve and restore habitat for the endangered light-footed clapper rail. Although these birds can fly, they rarely do so and migrate locally usually by walking or, occasionally, swimming. Thus, a clapper rail population within South San Diego Bay is essentially isolated from other southern California populations. As stated previously, restoration of the South San Diego Bay Unit will benefit the clapper rail and other threatened and endangered species. The restoration provide the opportunity to establish a population or populations of the endangered salt marsh bird's beak, a hemiparasitic plant that occurs in the upper elevations of salt marsh habitats. Populations of salt marsh bird's beak at other southern California wetlands are reproductively isolated from one another.

- j. Results in an increase in the aggregate acreage of wetland in the Southern California Bight;

The proposed restoration of the Otay River Floodplain Subarea will increase the aggregate acreage of tidal wetland in the Southern California Bight by approximately 66 acres, as required by the Coastal Commission and Regional Water Quality Control Board.

- k. Requires minimum maintenance;

The proposed restoration of the former solar evaporation pond and former agricultural lands at the Otay River Floodplain Subarea would be accomplished by excavating to the elevation of adjacent intertidal habitats. There are no hard structures needed, such as jetties, as the site is not subject to coastal erosion or deposition by wave action. The Otay River is dammed upstream of the proposed restoration site, and does not convey a sediment load that would be potentially damaging to a subtidal- intertidal wetland. Thus, maintenance dredging is not anticipated. Once vegetation has become established, there is no anticipated need for planting or maintenance of exotic weed species.

- l. Restoration project can be accomplished in a reasonably timely fashion; and,

It is anticipated that restoration of the Otay River Floodplain Subarea can be accomplished within the timeframes set forth in the MLMP.

- m. Site(s) in proximity to the Carlsbad desalination facility.

The South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge is located approximately 35 miles south of Aqua Hedionda Lagoon, the site of the Carlsbad Desalination Plant

3.3 Restrictions

- a. The permittee may propose a wetland restoration project larger than the minimum necessary size specified in subsection 3.1(c) above, if biologically appropriate for the site(s), but the additional acreage must (1) be clearly identified, and (2) must not be the portion of the project best satisfying the standards and objectives listed above.
- b. If the permittee jointly enters into a restoration project with another party: (1) the permittee's portion of the project must be clearly specified, (2) any other party involved cannot gain mitigation credit for the permittee's portion of the project, and (3) the permittee may not receive mitigation credit for the other party's portion of the project.
- c. The permittee may propose to divide the mitigation requirement between a maximum of two wetland restoration sites, unless there is a compelling argument, approved by the Executive Director, that the standards and objectives of subsections 3.1 and 3.2 will be better met at more than two sites.

Attachment 4

**U.S. Fish & Wildlife Service: San Diego Bay National
Wildlife Refuge-Sweetwater Marsh and South San
Diego Bay Units Comprehensive Conservation Plan
and Environmental Impact Statement Summary,
August 2006**

U.S. Fish and Wildlife Service

San Diego Bay
National Wildlife Refuge
*Sweetwater Marsh and
South San Diego Bay Units*

*Comprehensive Conservation
Plan and Environmental Impact
Statement*

Summary, August 2006

San Diego Bay National Wildlife Refuge

Sweetwater Marsh and South San Diego Bay Units

Final Comprehensive Conservation Plan and Environmental Impact Statement

Summary – August 2006

Vision Statement

The San Diego Bay National Wildlife Refuge protects a rich diversity of endangered, threatened, migratory, and native species and their habitats in the midst of a highly urbanized coastal environment. Nesting, foraging, and resting sites are managed for a diverse assembly of birds. Waterfowl and shorebirds over-winter or stop here to feed and rest as they migrate along the Pacific Flyway. Undisturbed expanses of cordgrass-dominated salt marsh support sustainable populations of light-footed clapper rail. Enhanced and restored wetlands provide new, high quality habitat for fish, birds, and coastal salt marsh plants, such as the endangered salt marsh bird's beak. Quiet nesting areas, buffered from adjacent urbanization, ensure the reproductive success of the threatened western snowy plover, endangered California least tern, and an array of ground nesting seabirds and shorebirds.

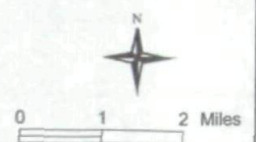
The San Diego Bay National Wildlife Refuge also provides the public with the opportunity to observe birds and wildlife in their native habitats and to enjoy and connect with the natural environment. Informative environmental education and interpretation programs expand the public's awareness of the richness of the wildlife resources of the Refuge. The Refuge serves as a haven for wildlife and the public to be treasured by this and future generations.

*U. S. Fish and Wildlife Service
California/Nevada Refuge Planning Office
2800 Cottage Way, Room W-1832
Sacramento, CA 95825*

August 2006



Figure 1
Location of the San Diego Bay National Wildlife Refuge




Source: California Spatial Information Library, Tele Atlas, USFWS

Carlsbad Field Office - 2003
 /stem/stacey/ssdbay/fig_sum/figures.apr



*nothing
eastern area
could be
restored
only but
13
acres*

Figure 3
Aerial View of the Sweetwater Marsh Unit

 Refuge boundary



Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

Carlsbad Field Office - 2003
/stem/stacey/ssdbay/fig_sum/figures.apr

incorporated into one document. This approach, which provides for the direct integration of the provisions of NEPA into the CCP process, complies with the requirement that Federal agencies integrate the NEPA process with other planning at the earliest possible time.

The CCP/EIS is a programmatic document intended to analyze proposed actions on a conceptual level, except in those cases where sufficient information is available to provide project-specific analysis. Therefore, the extent of analysis provided for each restoration and/or public use proposal reflects the level of detail currently available for the specific proposal. The habitat restoration proposals analyzed in the CCP/EIS should be viewed as conceptual. It is during subsequent project level planning, referred to as "step-down" planning, that additional studies would be conducted, additional baseline data would be gathered, the appropriate project level NEPA documentation would be prepared, all necessary permits would be acquired, and final engineering and restoration planning would be conducted. Step-down planning would also include a public involvement component similar to that provided during the CCP process.

The Final CCP is intended to provide a clear and comprehensive statement of the desired future conditions for the Refuge and to ensure public involvement in refuge management decisions. The public involvement component of CCP planning encourages public input throughout the process from initial scoping and public review of the Draft CCP to participating in refuge management decision and step-down planning following formal adoption of the plan.

Availability of the Final CCP/EIS

The Final CCP/EIS is available on-line at <http://sandiegorefuges.fws.gov>. A compact disc (CD) or hard copy of the document can be obtained by writing to: Victoria Touchstone, Refuge Planner, San Diego National Wildlife Refuge (NWR) Complex, 6010 Hidden Valley Road, Carlsbad, CA 92011. Other contact methods include: 760-431-9440 ex. 349 (telephone), 760-930-0256 (facsimile), or Victoria_Touchstone@fws.gov (email).

The Final CCP/EIS is also available at the following locations: San Diego NWR Complex (6010 Hidden Valley Road, Carlsbad); Tijuana Estuary Visitor Center (301 Caspian Way, Imperial Beach); Chula Vista Public Library, Civic Center Branch (365 F Street) and South Chula Vista Branch (389 Orange Avenue); Coronado Public Library (640 Orange Avenue, Coronado); Imperial Beach Library (810 Imperial Beach Boulevard, Imperial Beach); National City Library (200 East 12th Street, National City); and City of San Diego, Central Library (820 E Street) and Otay Mesa Branch Library (3003 Coronado Avenue).

Purpose and Need

The purpose of developing the Comprehensive Conservation Plan (CCP) for the Refuge is to provide managers with a 15-year strategy for achieving refuge purposes and contributing toward the mission of the National Wildlife Refuge System (Refuge System), consistent with the sound principals of fish and wildlife conservation and legal mandates. The CCP is flexible; it will be revised periodically to ensure that its goals, objectives, strategies, and timetables are still valid and appropriate.

This CCP will also satisfy a condition of the Public Agency Lease between the California State Lands Commission and the Service requiring the Service to provide the State Lands Commission with a plan for managing the leased tidelands included within the boundary of the South San Diego Bay Unit. The lease condition requires that the plan "detail the Lessee's management and development plans for the Refuge," as well as "include a public access component."

Operated and managed by the Service, the Refuge System comprises more than 545 national wildlife refuges with a combined area of more than 95 million acres. The majority of refuge lands (approximately 77 million acres) are in Alaska. The remaining acres are spread across the other 49 states and several island territories.

The mission of the Refuge System is "To administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (16 USC 668dd et seq.).

Vision Statement for the Refuge

The San Diego Bay National Wildlife Refuge protects a rich diversity of endangered, threatened, migratory, and native species and their habitats in the midst of a highly urbanized coastal environment. Nesting, foraging, and resting sites are managed for a diverse assembly of birds. Waterfowl and shorebirds over-winter or stop here to feed and rest as they migrate along the Pacific Flyway. Undisturbed expanses of cordgrass-dominated salt marsh support sustainable populations of light-footed clapper rail. Enhanced and restored wetlands provide new, high quality habitat for fish, birds, and coastal salt marsh plants, such as the endangered salt marsh bird's beak. Quiet nesting areas, buffered from adjacent urbanization, ensure the reproductive success of the threatened western snowy plover, endangered California least tern, and an array of ground nesting seabirds and shorebirds.

The San Diego Bay National Wildlife Refuge also provides the public with the opportunity to observe birds and wildlife in their native habitats and to enjoy and connect with the natural environment. Informative environmental education and interpretation programs expand the public's awareness of the richness of the wildlife resources of the Refuge. The Refuge serves as a haven for wildlife and the public to be treasured by this and future generations.

Refuge Goals

Goals and objectives established for a Refuge are the unifying element of Refuge management, intended to identify and focus management priorities and to provide a link between management actions, Refuge purposes, and NWRS mission and goals.

Sweetwater Marsh Unit

The following goals provide guiding principles for the Sweetwater Marsh Unit:

- Goal 1: Protect, manage, enhance, and restore coastal wetland and upland habitats to benefit native fish, wildlife, and plant species within the Sweetwater Marsh Unit.
- Goal 2: Support recovery and protection efforts for the federally and state listed threatened and endangered species and species of concern that occur within the Sweetwater Marsh Unit.
- Goal 3: Protect and restore the environmental health of the Refuge's coastal salt marsh and upland habitats by making contaminants remediation a priority for Refuge lands, adjacent properties, and upstream developments.

The purposes of the San Diego Bay National Wildlife Refuge include:

“to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds, and to maintain and enhance the biological diversity of native plants and animals” 16 U.S.C. § 1531-1543 (Endangered Species Act of 1973, as amended) and 70 Stat. 1119 (Fish and Wildlife Act of 1956, as amended);

... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. § 742f(a)(4) “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956); and

... shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, ...” 16 U.S.C. § 664 (Fish and Wildlife Coordination Act).”

Issues

Planning issues were identified through discussions with planning team members and workshop participants, and through the public scoping process. From these discussions and input provided during scoping, key issues were identified for both the Sweetwater Marsh Unit and the South San Diego Bay Unit. These issues, which are presented in detail in Chapter 1 of the Final CCP/EIS, include topics related to Refuge boundary expansion, habitat enhancement and restoration, remediation of contaminants, balancing the habitat needs of the various species supported on the Refuge, managing invasive species, conflicts between species including predation, and the appropriateness of various public uses on the Refuge.

Refuge Setting

The Sweetwater Marsh and South San Diego Bay Units encompass approximately 2,620 acres of land and water located in the southern portion of San Diego Bay. Refuge habitats offer resting, foraging, and nesting areas for an abundant and diverse assemblage of birds, as well as habitats that support a variety of fish and marine and terrestrial invertebrates, and a smaller array of amphibians, reptiles, and mammals.

Approximately 2,100 acres of open water within San Diego Bay are included within the acquisition boundary of the South San Diego Bay Unit, of which approximately 1,500 acres are currently managed as part of the Refuge System. San Diego Bay is a natural, nearly enclosed embayment with a water surface area of approximately 17 square miles at mean lower low water (MLLW) and a total length of approximately 15 miles. The natural characteristics of the bay have been significantly altered over the years as portions of the bay were dredge to facilitate commercial and military ship operations, and the adjacent wetlands were filled to accommodate urban development. Today, deep subtidal habitat accounts for 28 percent (4,443 acres) of the total acreage in the bay, an increase of 16 percent from 1859, while 41 percent of the historic shallow subtidal habitat within the bay has been lost.

A significant area of historic coastal salt marsh habitat is protected along the eastern edge of the south bay within the Sweetwater Marsh Unit of the San Diego Bay NWR Refuge. This habitat supports a variety of migratory shorebirds and wintering waterfowl, as well as the endangered light-footed clapper rail, a year-round resident of the marsh. Although the upland areas on this



Figure 5
Habitats of Sweetwater Marsh Unit

Source: James Thiede, Local Agency Partnership 2000 (2 ft imagery)

0 500 1000 Feet

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 /stacey/sdco/ssdbay/fig_sum/sdbay_veg.apr

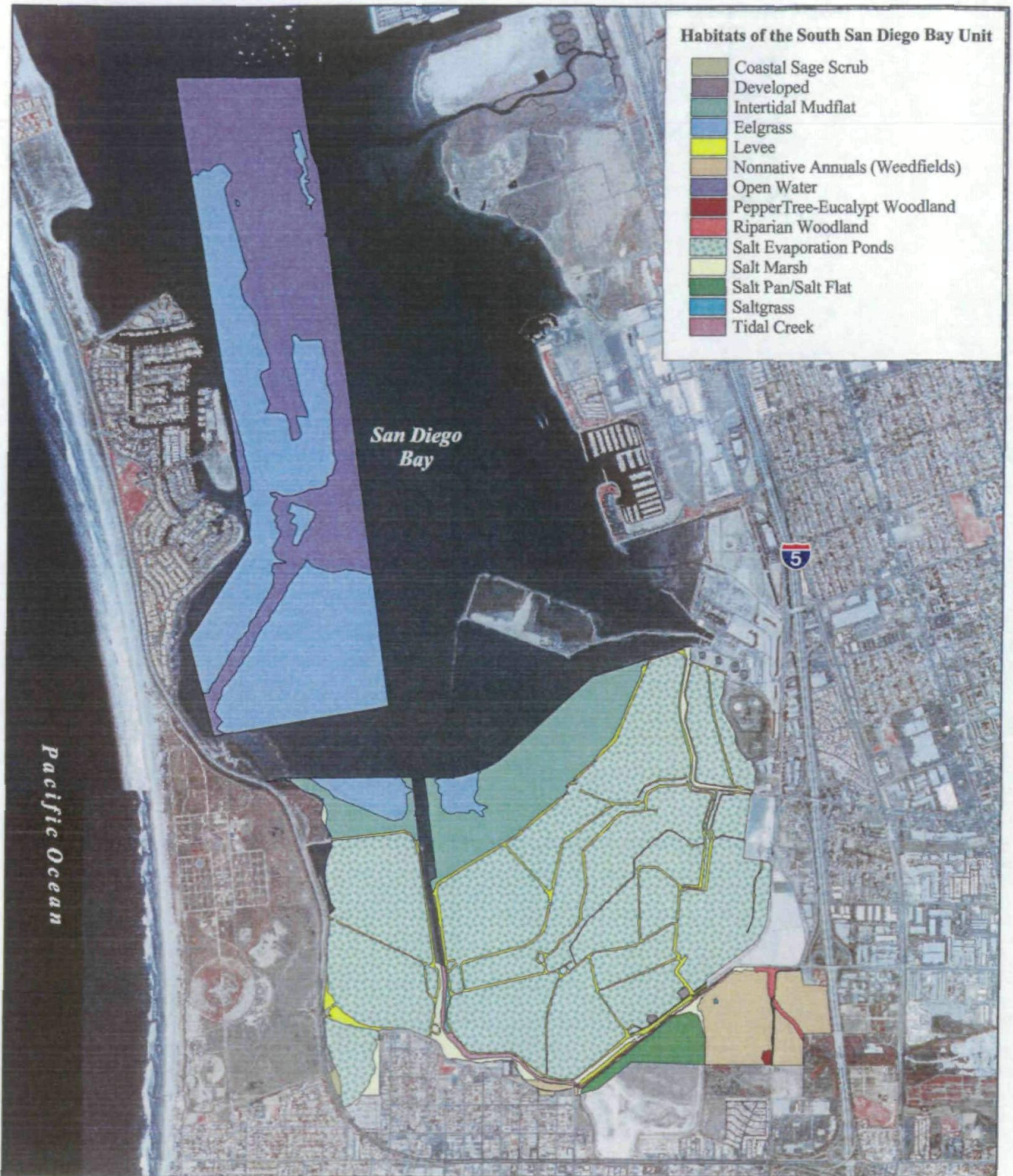


Figure 6
Existing Habitats of the South San Diego Bay Unit



Source: James Thiede, Merkel & Associates, Inc., Local Agency Partnership 2000 (2 ft imagery)

Carlsbad Field Office - 2004
 /stacey/sdco/ssdbay/fig_sum/sdbay_veg.apr

The South Bay's shallow subtidal habitat also supports a group of twelve species of fish that are indigenous to the bays and estuaries of the Southern California Bight. The extensive shallow water habitat and eelgrass beds of the South Bay provide important habitat for these and a variety of other fish, including midwater, schooling fishes, such as northern anchovies, slough anchovies, and topsmelt. These species, in turn, represent a major forage resource for predatory fish and avian species. The warmer, hypersaline waters of the South Bay also offer shelter for a number of fish species commonly encountered further south in the Eastern Subtropical and Tropical Pacific. The south end of San Diego Bay also appears to function as an important nursery area for juvenile California halibut and young spotted and barred sand bass.

Intertidal mudflats provide foraging habitat for fish during high tide, while at low tide, great numbers of shorebirds assemble to forage on the many invertebrates available on the exposed flats. In addition to foraging, shorebirds also depend upon the mudflats for roosting and resting. The most extensive mudflats within the South Bay are those that lie to the north of the salt ponds within the Refuge Unit. The Service observed tens of thousands of birds, representing 67 species, in this area during a year-long survey conducted in 1993 and 1994. The majority of the birds observed were shorebirds and seabirds.

Smaller areas of coastal salt marsh occur in the few natural drainages that flow through the Refuge Unit, as well as along the bayside of the outer levees of the salt ponds. This habitat provides the Belding's savannah sparrow with nesting and foraging opportunities. Within the lower reach of the Otay River, this habitat as well as some brackish and freshwater marsh areas, provide habitat for the endangered light-footed clapper, various shorebirds, and wintering and breeding waterfowl.

Although not considered a natural habitat, the salt evaporation ponds located within the South San Diego Bay Unit provide relatively isolated nesting and resting habitat for a wide range of avian species, as well as some unique foraging habitat for several species of birds. Solar salt production has occurred in this location for over 100 years. During this time, the salt ponds have been an important stopover point for large numbers of migratory and wintering birds. In addition, the salt pond levees provide regionally important nesting habitat for seven species of colonial seabirds.

Due to the hypersaline nature of the ponds, native wetland vegetation and bay invertebrates are essentially absent from the majority of the ponds. The only fish in the ponds are those that come in with the initial intake of tidal water. Once in the system, they can only survive in the lowest salinity primary ponds, cannot escape back into the bay, and do not reproduce. The ponds do however support several species of brine invertebrates that are preyed upon by a variety of birds, particularly eared grebes and phalaropes.

Habitat Type	Approximate Acres
Coastal Sage Scrub	2.0
Developed	2.0
Eel Grass	440.0
Intertidal Mudflat	220.0
Levee	85.0
Nonnative Annuals	98.0
Open Water	410.0
Eucalyptus Woodland	1.0
Riparian Woodland	5.0
Road	2.0
Salt Ponds	964.0
Salt Marsh	30.0
Salt Pan/Salt Flat	30.0
Tidal Creek	11.0

Sweetwater Marsh Unit

Alternative A, No Action (Figure A-1) – The Sweetwater Marsh Unit currently operates without an official management plan. Under the no action alternative, the current management activities would be incorporated into the CCP to formally establish ongoing management direction for this Refuge Unit for the next 15 years. This alternative, which assumes no change to past and present management activities on the Refuge Unit, represents the baseline from which other “action” alternatives have been evaluated.

Under this alternative, wildlife and habitat management activities would continue to focus on the protection and recovery of the federally listed endangered and threatened species supported on this Unit. Such activities include invasive weed management within the upland transition areas, endangered species monitoring, and annual site preparation of the least tern and snowy plover nesting area on the D Street Fill. The latter activity is conducted in partnership with the Port, which manages nesting habitat on the D Street Fill located outside the Refuge boundary.

Predator management would continue to be implemented to reduce the loss of California least tern, western snowy plover, and light-footed clapper adults, chicks, and eggs to mammalian and avian predation. Predator management is addressed in a step-down Predator Management Plan that accompanies the Final CCP/EIS.

Implementation of the Predator Management Plan is proposed pursuant to the Service’s endangered species management responsibilities and would occur on the Refuge in conjunction with other wildlife and habitat management activities. Under the plan, predator management would be conducted as a comprehensive wildlife damage control program that addresses a range of management actions from vegetation control and nesting habitat enhancement to non-lethal and lethal control of both mammalian and avian predators. The most effective, selective, and humane techniques available to deter or remove individual predators or species that threaten nesting, breeding, or foraging California least terns, western snowy plovers, or light-footed clapper rails would be implemented.

The San Diego National Wildlife Refuge Complex (Complex), consistent with the requirements of the National Fire Plan, has developed a fire management plan for all of the Refuges within the Complex. This plan outlines the fire management objectives for the Complex, describes the Complex’s wildland fire management situation, and presents the Complex’s fire management strategies. With respect to the San Diego Bay National Wildlife Refuge, the plan focuses on preparedness, wildland fire operations, prevention, and detection. Prescribed and wildlife fire use are not proposed as a strategy for achieving land management objectives on this Refuge.

Alternative B, Implement Habitat Enhancement (Figure A-2) – Under this alternative, management activities would focus on enhancing the Refuge’s coastal salt marsh habitat for the benefit of a variety of species, particularly the endangered light-footed clapper rail and salt marsh bird’s beak. In addition to the activities described under Alternative A, this alternative also includes proposals to enhance tidal circulation and improve marsh management.

Historic tidal channels in Sweetwater Marsh (channels that were blocked when fill was placed in the marsh to provide access to Gunpowder Point) would be reconnected to increase tidal circulation over approximately 60 to 80 acres of the main marsh complex. In addition, the feasibility of lowering or removing an existing weir at the south end of Paradise Marsh to improve tidal circulation within that portion of the Refuge Unit would also be explored.

and strategies for each goal vary among alternatives. The objective statements and associated strategies for each Refuge goal are presented in Chapter 2 of the Final CCP/EIS. The objectives have been written to address the preferred alternative (Alternative C), however, the various strategies that would implement the objective in whole or in part are also presented and the specific alternative that would implement a particular strategy is identified. Specific acreage figures, time frames, and other measurable elements presented for each objective may change depending upon which alternative is finally selected for implementation.

South San Diego Bay Unit

Alternative A, No Action (Figure A-4) – At present, this Refuge Unit operates without a comprehensive management plan; therefore, under this alternative, the management practices identified as necessary when the Unit was established would continue to be implemented. No changes to present management would occur and the current management activities would be incorporated into the CCP to formally establish management direction for the next 15 years.

Current management activities include enhancement of nesting and foraging opportunities for the California least tern, using funds provided by the Port in accordance with the agreement that resulted in the establishment of the Refuge Unit; endangered species monitoring; predator management; invasive plant species control, and law enforcement to address unauthorized activities on Refuge lands, including trespass, transient encampments, and illegal dumping.

The current opportunities of public use, involving fishing, wildlife observation, environmental education, and boating, would be retained, but no new uses would be initiated. In addition, commercial solar salt production would continue to operate under a Refuge Special Use Permit.

Alternative B, Expand Habitat Management and Enhance Nesting Opportunities (Figure A-5) – Under this alternative, habitat values for California least tern, western snowy plover, and colonial nesting seabirds would be improved by enhancing the nesting substrate on various salt pond levees, recontouring levee surfaces to improve access from nesting areas to the edge of the ponds, and expanding nesting habitat within the salt ponds. A minimum of 20 acres of new nesting area would be created within the primary ponds, requiring the importation of approximately 200,000 cubic yards of appropriate fill material and a minimum of 18,000 cubic yards of clean, light-colored sand. This alternative also proposes the creation of additional roosting habitat within the salt ponds for California brown pelicans and the initiation of a public outreach program to address the problems associated with improperly discarded fishing line and other debris in the bay.

Under this alternative, no change to the existing public use programs, as described in Alternative A, would occur and commercial solar salt production would continue at present levels.

Alternative C, Expand Habitat Management, Enhance Nesting Opportunities, Implement Habitat Restoration, and Expand Existing Public Use Opportunities (Figure A-6) – Under Alternative C, management activities would be increased to include several habitat restoration proposals. These proposals reflect the need to restore the variety of coastal habitats that have been lost to development in California, and particularly in San Diego Bay, over the past 140 years. Specific proposals include restoring some salt ponds to tidal influence and excavating portions of the Otay River floodplain to restore intertidal habitat, which historically occurred here. The restoration of intertidal habitat, particularly cordgrass-dominated salt marsh habitat, is intended to benefit the light-footed clapper rail and other avian species, while also expanding the area available to support a variety of fish and benthic invertebrate species.

achieve elevations known to support specific habitat types in San Diego Bay. For instance, to support cordgrass-dominated salt marsh habitat the elevations of the sediments in the ponds should range from between +3.5 feet and +4.5 feet MLLW. Achieving the desired elevation would require importing fill. If the material excavated from the Otay River floodplain is suitable for placement in the ponds, this material would be used to achieve the desired elevations. The only changes to the current configuration of the pond levees as a result of restoration would be breaches in the levees to facilitate tidal exchange. Levees would be monitored and maintained to support seabird nesting and shorebird and other waterbird roosting.

The estimated volumes of cut and fill material associated with the grading necessary to restore habitat under one or more of the restoration options proposed for this Alternative are presented in Table 6. The fill volumes shown for the Otay River floodplain represent the maximum amount of fill that would be placed within the areas designated for upland restoration. The maximum depth of this fill on each area would be eight feet. The volumes presented in this table are estimates based on very preliminary grading plans and do not take into consideration existing soil characteristics. These cut and fill figures would be refined and the existing soils characterized as part of final restoration planning.

In addition to the uses currently occurring on this Refuge Unit, Alternative C proposes to include additional opportunities for fishing and wildlife observation by opening the northern levee of Pond 11 to public access. Fishing would be permitted from the bayside of the levee. The number of guided nature tours currently conducted within the salt works would increase; a pedestrian pathway would be designed and constructed to the north of the Bayshore Bikeway in the vicinity of Ponds 10 and 23; and a proposed alignment for the westernmost portion of the Otay Valley Regional Trail would be designated along the eastern edge of the Refuge Unit. Solar salt production would continue, but within a reduced footprint.

Alternative D (preferred alternative): Expand Habitat Management, Enhance Nesting Opportunities, Maximize Habitat Restoration, and Provide Additional Public Use Opportunities (Figure A-11) – Alternative D proposes to enhance opportunities for seabird nesting, restore native habitat in the Otay River floodplain, and restore tidal circulation within the majority of the salt ponds. Those ponds that are not breached would be maintained in their current configuration and the water in the ponds would be managed to support a variety of migratory birds and wintering waterfowl. The implementation of this alternative, which would maximize the habitat potential of the salt ponds, would result in the restoration of approximately 650 acres of existing salt ponds to tidal influence, with much of the restoration targeted for cordgrass-dominated salt marsh habitat (Figure A-12). In those ponds to be restored, the only proposed changes to the levees are the openings required to facilitate tidal circulation. The majority of the levee system would be retained in its current configuration to accommodate seabird nesting and shorebird roosting. Approximately 36 acres of new seabird nesting habitat would also be created. A managed water area of approximately 275 acres would be maintained within those ponds that are too high to benefit from tidal circulation. Bay water would circulate through these ponds and the water levels in the ponds would be regulated to meet the seasonal needs of migratory birds, wintering waterfowl, and seabird and shorebird nesting. About 45 acres of this managed water system would be devoted to the production of brine invertebrates, a resource currently exploited by certain avian species, including phalaropes and eared grebes. The nesting and roosting enhancements described in Alternative B and the restoration options for the Otay River floodplain described in Alternative C would also be implemented under this alternative. The acreage of each habitat to be restored under this alternative is presented in Table 7.

Habitat Types (Acres)							
Shallow subtidal	Intertidal mudflat	Cordgrass-dominated salt marsh	Pickleweed-dominated salt marsh	Active salt ponds	Managed water area	Brine production area	New nesting habitat
44	124	447	32	0	229	44	36

The draft CCP/EIS evaluated three implementation scenarios for Alternative D, all of which would ultimately result in the elimination of solar salt production. Under the first scenario, the salt pond complex would be restored in a single action; scenario 2 describes a phased approach to restoration; and under the third scenario, which could occur as a single action or through a phased approach, no reconfiguration of the pond elevations would occur, resulting in a different habitat mix than that anticipated under the first two scenarios. The habitat types that would be achieved under Scenario 3 are illustrated in Figure A-13.

The preliminary estimates of the volume of cut and fill material needed to implement the various restoration options are presented in Table 8. These volumes are based on very preliminary grading plans and would be refined during final restoration planning.

The existing public uses on the South San Diego Bay Unit would be expanded to include opportunities for environmental interpretation at the south end of the bay along existing and proposed public access routes and around Pond 28 through the development of a 1.5-mile interpretive trail. Opportunities for wildlife observation and photography would be expanded to include increased numbers of guided tours within the salt pond complex, construction of the pedestrian pathway described under Alternative C, and design and development of observation areas around the southern and eastern perimeter of the Refuge Unit. Fishing and boating activities would continue, but the proposal to provide an opportunity for shoreline fishing, as described in Alternative C, would not be implemented under this alternative. Environmental education programs would continue to be supported on this Refuge Unit.

Description of the Goals, Objectives and Strategies for South San Diego Bay Unit

Although the goals are the same for each of the four alternatives described for the South San Diego Bay Unit there are a variety of ways in which to achieve these goals. Therefore, the objectives and strategies for each goal vary among alternatives. The objective statements and associated strategies for each Refuge goal are presented in Chapter 2 of the Final CCP/EIS. The objectives have been written to address the preferred alternative (Alternative D), however, the various strategies that would implement the objective in whole or in part are also presented and the specific alternative that would implement a particular strategy is identified. Specific acreage figures, time frames, and other measurable elements presented in the objectives may change depending upon which alternative is finally selected for implementation.

Environmental Consequences

The Service has conducted an analysis and evaluation of the environmental consequences of implementing the various alternatives described for each Refuge Unit. This impact evaluation has considered all aspects of the affected environment, including physical, biological, cultural, and socio-economic resources. A summary of potential effects from implementing the alternatives proposed for the Sweetwater Marsh and South San Diego Bay Units are presented in Tables 9 and 10, respectively. Habitat changes are presented in Tables 11 and 12.

<p align="center">Table 9 Summary of Potential Effects of Implementing Alternatives A, B, or C for the Sweetwater Marsh Unit</p>			
Resource	Alternative A	Alternative B	Alternative C
Physical Environment			
Topography/Visual Quality	No Change in Existing Conditions	No Change in Existing Conditions	Moderate benefits to visual quality would result from replacing weedy, nonnative vegetation on Gunpowder Point with native habitat.
Agricultural Resources	No Change in Existing Conditions	No Change in Existing Conditions	No adverse effects.
Hydrology	No Change in Existing Conditions	Various impediments to tidal and freshwater circulation in the marsh would be removed representing a moderate benefit to overall habitat quality in the marsh.	Same as Alternative B
Water Quality	No Change in Existing Conditions	Implementation of Best Management Practices would reduce the potential for adverse effect from grading to less than significant.	Same as Alternative B
Habitat			
Coastal Salt Marsh	No Change in Existing Conditions	Minor temporary adverse affects could result during the implementation of tidal circulation improvements, but these would be offset by the moderate benefits to habitat quality that would result from improving tidal and freshwater circulation within the marsh.	Minor temporary adverse affects could result during the implementation of proposed restoration and circulation improvements, but these would be more than offset by the significant benefits to habitat quality would result from improved circulation and the restoration of 25 acres of intertidal wetlands.
Native Uplands	No Change in Existing Conditions	Slight benefits to upland s habitat would result from increased control of nonnative invasive plant species.	Significant benefits would result from the restoration of 20 acres of native upland habitat.

**Table 9 (continued)
Summary of Potential Effects of Implementing
Alternatives A, B, or C for the Sweetwater Marsh Unit**

Resource	Alternative A	Alternative B	Alternative C
<i>Wildlife and Fisheries (continued)</i>			
All Birds	No Change in Existing Conditions	Management of salt marsh habitat would be expanded; tidal and freshwater circulation within the marsh improved; and the seabird nesting area on D Street Fill would be enhanced. These actions would provide moderate benefit to birds.	In addition to the actions proposed under Alternative B, 25 acres of cordgrass-dominated salt marsh would be restored; 33 acres of the D Street Fill would be designated for <u>tern and plover</u> nesting; and 20 acres of native upland habitat would be restored, representing a significant benefit to birds.
Waterfowl	No Change in Existing Conditions	Action described above would provide slight benefits for waterfowl.	Same as Alternative B
Seabirds	No Change in Existing Conditions	Action described above would provide moderate benefits for seabirds.	Actions described above would provide significant benefits for seabirds.
Shorebirds and Other Waterbirds	No Change in Existing Conditions	Action described above would provide moderate benefits for shorebirds and other waterbirds.	Actions described above would provide moderate benefits for shorebirds and other waterbirds.
Raptors	No Change in Existing Conditions	No Change in Existing Conditions	No Change in Existing Conditions
Other Land Birds	No Change in Existing Conditions	No Change in Existing Conditions	The restoration of 20 acres of native upland habitat would significantly benefit land birds, particularly those associated with coastal sage scrub and maritime succulent scrub habitat.

Table 9 (continued)
Summary of Potential Effects of Implementing
Alternatives A, B, or C for the Sweetwater Marsh Unit

Resource	Alternative A	Alternative B	Alternative C
<i>Endangered & Threatened Species (continued)</i>			
California brown pelican	No Change in Existing Conditions	No new adverse or beneficial effects.	No new adverse or beneficial effects.
Western snowy plover	No Change in Existing Conditions	Enhance of existing nesting habitat and better access to foraging habitat would provide moderate benefits.	<u>Strategies to improve nesting substrate, provide new fencing, and improve access to foraging areas, would result in moderate benefits for snowy plovers.</u>
California gnatcatcher	No Change in Existing Conditions	No Change in Existing Conditions	Moderate benefits would result from the restoration of coastal sage scrub habitat on Gunpowder Point.
<i>Public Use</i>			
Hunting/Fishing	No Change in Existing Conditions (Refuge Unit is closed to hunting and fishing.)	No Change in Existing Conditions	No Change in Existing Conditions
Wildlife Observation/Photography	No Change in Existing Conditions (Opportunities for these uses are provided at Gunpowder Point.)	No Change in Existing Conditions	Realigned trail system on Gunpowder Point and restored upland habitat would moderately improve opportunities for wildlife observation and photography.
Environmental Education	No Change in Existing Conditions (Opportunities for this use are provided at Gunpowder Point.)	No Change in Existing Conditions	Realigned trail system and new interpretive elements would significantly benefit environmental education programs.
Environmental Interpretation	No Change in Existing Conditions	Moderate benefits would result from new interpretive elements near Paradise Marsh and the F&G Street Marsh.	Realigned trail system and new interpretive elements would significantly benefit the Refuge.
Chula Vista Nature Center	No Change in Existing Conditions	No Change in Existing Conditions	New interpretive elements would complement the exhibits provided within the Nature Center.

<p align="center">Table 10 Summary of Potential Effects of Implementing Alternatives A, B, C, or D for the South San Diego Bay Unit</p>				
Resource	Alternative A	Alternative B	Alternative C	Alternative D
Physical Environment				
Topography/Visual Quality of the Otay River Floodplain	No Change in Existing Conditions	No Change in Existing Conditions	<p>This alternative proposes some filling within the floodplain in areas designated for upland restoration. These areas would not be raised more than eight feet. At this depth, public views of the restored floodplain and distance views of the bay and ocean would be preserved, and significant adverse affects to visual quality would be avoided.</p> <p>Restoring the existing weedy fields with native upland and wetland habitat would be viewed as a moderate benefit to the area's visual quality.</p>	Same as Alternative C
Visual Quality within San Diego Bay	No Change in Existing Conditions	No Change in Existing Conditions	<p>Converting 200 to 440 acres of salt ponds to coastal wetlands would alter views of the South Bay by replacing open water with habitat that is only inundated during high tides. This could be viewed by some as an adverse effect, while others may view this change as inconsequential. Restoring the area to its historic condition is not considered by the Service to be an adverse effect to visual quality.</p>	<p>Under this alternative, 650 acres of open water would be converted to intertidal habitat. The conclusions regarding effects to visual quality that are presented for Alternative C would also apply to this alternative.</p>

<p align="center">Table 10 (continued) Summary of Potential Effects of Implementing Alternatives A, B, C, or D for the South San Diego Bay Unit</p>				
Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Physical Environment(continued)</i>				
Downstream Flood Characteristics (Otay River Floodplain)	No Change in Existing Conditions	No Change in Existing Conditions	Preliminary modeling of the flood characteristics in the Otay River floodplain indicate that under existing conditions the peak water surface elevation at the railroad bridge is 13 feet NAVD88. Under restored conditions, the elevation would be 1 to 2 feet higher. The current elevation of the railroad bridge is approximately 14.3 feet NAVD88; therefore, the predicted increase in the peak water surface elevation at the railroad bridge could adversely affect the structural integrity of the bridge. Potential adverse effects would be avoided through the implementation of appropriate measures, identified in coordination with the City of San Diego, to protect the integrity of the bridge during a flood event.	Same as Alternative C
Water Quality (Effects of grading)	No Change in Existing Conditions	Grading would be confined to the salt ponds; therefore, no adverse effects to the water quality in the bay are anticipated.	Implementation of Best Management Practices would reduce the potential for adverse effect to less than significant.	Same as Alternative C

**Table 10 (continued)
Summary of Potential Effects of Implementing
Alternatives A, B, C, or D for the South San Diego Bay Unit**

Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Habitats (continued)</i>				
Intertidal (Mudflats and Salt Marsh)	No Change in Existing Conditions	No Change in Existing Conditions	Within the Otay River floodplain, restoration could result in temporary impacts to about 6 acres of intertidal habitat. Another 4 acres of high marsh habitat could be lost to implement public use proposals. These impacts would be more than offset by the restoration of approximately 260 to 525 acres of intertidal wetlands. The proposed restoration would represent a significant benefit to intertidal habitat.	Temporary impacts to <u>intertidal habitat</u> of up to 6 acres <u>would occur</u> in the Otay River floodplain and <u>18 acres of salt pond habitat would be converted to nesting habitat.</u> These impacts would be more than offset by the restoration of <u>63 to 88 acres of intertidal wetlands within the Otay River flood plain.</u> Further, <u>650 acres of salt ponds would be converted to intertidal habitat, representing a significant increase in intertidal habitat in the bay.</u>
Freshwater Wetlands	No Change in Existing Conditions	No Change in Existing Conditions	<u>Restoration within the Otay River floodplain could result in temporary impacts to 3 acres of freshwater wetlands. This loss would be more than offset by the restoration of 16 acres of freshwater wetlands, representing a moderate benefit.</u>	Same as Alternative C
Upland Habitat	No Change in Existing Conditions	No Change in Existing Conditions	Between 40 and 60 acres of non-native uplands, dominated by garland chrysanthemum, would be restored to native upland habitat, representing a significant benefit.	Same as Alternative C

Table 10 (continued)				
Summary of Potential Effects of Implementing Alternatives A, B, C, or D for the South San Diego Bay Unit				
Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Wildlife and Fisheries (continued)</i>				
Shorebirds	No Change in Existing Conditions	Recontouring of the levee slopes would improve foraging access along the pond edges. In addition, shorebirds that nest at the salt works could benefit from nesting enhancements.	Restoration of coastal wetlands within the Otay River floodplain and the salt ponds would provide additional foraging habitat for shorebirds, representing a significant benefit.	Same as Alternative C
Phalaropes/Eared Grebes	No Change in Existing Conditions	No Change in Existing Conditions	A reduction in the availability of brine invertebrates within the salt ponds could cause phalaropes and grebes to abandon the use of this area during migration. Although this would reduce the diversity and abundance of shorebirds at the salt works, this would not result in significant adverse effects to these species range wide.	Although salt production would be eliminated under this alternative, a managed brine water component has been incorporated into the restoration proposal to ensure the continued availability of brine invertebrates for these species, albeit at a reduced density. The consequences of reducing the availability of brine invertebrates would be the same as described in Alternative C.
Other Waterbirds	No Change in Existing Conditions	No Change in Existing Conditions	Restoration of foraging habitat would represent a significant benefit.	Same as Alternative C

**Table 10 (continued)
Summary of Potential Effects of Implementing
Alternatives A, B, C, or D for the South San Diego Bay Unit**

Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Wildlife and Fisheries (continued)</i>				
Invertebrates	No Change in Existing Conditions	<p>No change in existing conditions for terrestrial invertebrates.</p> <p>With the exception of the few invertebrates that tolerate hypersaline conditions, suitable habitat for native invertebrates is no available within the salt ponds. The changes in the ponds to accommodate additional nesting habitat and pelican platforms would have no adverse effects on brine invertebrates.</p>	<p>Impacts to terrestrial invertebrates due to habitat restoration would be less than significant.</p> <p>The restoration of the salt ponds and Otay River floodplain would provide significant new habitat for many native invertebrates, while habitat for brine invertebrates would be reduced under this alternative.</p>	<p>Impacts to terrestrial invertebrates due to habitat restoration would be less than significant.</p> <p>Breaching the salt ponds could result in short term losses of some invertebrates located immediately adjacent to the ponds, however, normal salinity ranges would be restored within less than a month. The restoration of the salt ponds and Otay River floodplain, which would provide significant new habitat for many native invertebrates, would more than offset these losses.</p> <p>Existing habitat for brine invertebrates would be eliminated, but 44 acres of new habitat is proposed within those ponds designated for brine management.</p>

Table 10 (continued) Summary of Potential Effects of Implementing Alternatives A, B, C, or D for the South San Diego Bay Unit				
Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Endangered & Threatened Species (continued)</i>				
Western snowy plover	No Change in Existing Conditions	Nesting enhancements, controlling water levels in Pond 20 for nesting, and improving access to foraging areas would provide moderate benefits.	Expanded nesting and <u>improved</u> <u>chick</u> foraging opportunities would provide significantly benefits.	Same as Alternative C.
Pacific green sea turtle	No Change in Existing Conditions	No Change in Existing Conditions	No Change in Existing Conditions	Potential adverse effects to eelgrass, which provides habitat for the sea turtles, would be mitigated in accordance with the South California Eelgrass Mitigation Policy.
<i>Solar Salt Production</i>				
Continuation of Solar Salt Production	No Change in Existing Conditions	Slight changes in the operation would result from the construction of new nesting habitat. Production would continue.	Slight to moderate changes in the current operation would occur under this alternative. Production would continue within a reduced footprint.	This alternative would result in the elimination of solar salt production within the Refuge Unit.
<i>Public Use</i>				
Hunting	No Change in Existing Conditions (the Refuge Unit is closed to hunting)	No Change in Existing Conditions	No Change in Existing Conditions	No Change in Existing Conditions
Fishing	No Change in Existing Conditions (Fishing is permitted in the bay.)	No Change in Existing Conditions	Onshore fishing in the bay would be permitted from the northern levee of Pond 11.	No Change in Existing Conditions

Table 10 (continued)				
Summary of Potential Effects of Implementing Alternatives A, B, C, or D for the South San Diego Bay Unit				
Resource	Alternative A	Alternative B	Alternative C	Alternative D
<i>Cultural Resources (continued)</i>				
Archaeological	No Change in Existing Conditions	No Change in Existing Conditions	Potential for impacts to subsurface deposits. Mitigation would be implemented if resources are discovered that could be impacted.	Same as Alternative C
<i>Socioeconomic</i>				
Land Use	No Change in Existing Conditions	No Change in Existing Conditions	No Change in Existing Conditions	No Change in Existing Conditions
Traffic/Parking	No Change in Existing Conditions	No Change in Existing Conditions	Opening the northern levee of Pond 11 to fishing and wildlife observation would increase the parking demand at the Biological Study Area. Coordination with the San Diego County Parks Department would be required.	No increase in parking demands at the Biological Study Area would occur, however, there would be a slight increase in the demand for on-street parking in Imperial Beach associated with new opportunities for wildlife observation and environmental interpretation.
Public Utilities	No Change in Existing Conditions	No Change in Existing Conditions	Coordination with the City of San Diego is required prior to restoration <u>in</u> the Otay River floodplain to ensure protection of <u>and access to</u> existing sewer and water utilities. The temporary relocation of the bicycle path along the Saturn Boulevard may <u>also</u> be required during restoration.	Same as Alternative C
Vectors/Odors	No Change in Existing Conditions	No Change in Existing Conditions	Improved water circulation and habitat restoration would reduce breeding areas for mosquitoes; some potential for wetland odors.	Same as Alternative C

Table 11 Summary of Habitat Changes on the San Diego Bay NWR under Each Alternative		
<u>Habitat Type</u>	<u>Existing Conditions</u> (approximate acreages)	<u>Proposed Conditions</u> (approximate acreages)
<i>Sweetwater Marsh Unit Alternative A</i>		
<u>Tidal Wetlands</u>	<u>210 acres</u>	<u>210 acres</u>
<u>Available Nesting Habitat¹ (e.g. least terns, snowy plovers)</u>	<u>32 acres</u>	<u>32 acres</u>
<u>Native Uplands</u>	<u>10 acres</u>	<u>10 acres</u>
<u>Disturbed Uplands and Developed Land</u>	<u>65 acres</u>	<u>65 acres</u>
<i>Sweetwater Marsh Unit Alternative B</i>		
<u>Tidal Wetlands</u>	<u>210 acres</u>	<u>213 acres</u>
<u>Available Nesting Habitat¹ (e.g. least terns, snowy plovers)</u>	<u>32 acres</u>	<u>32 acres</u>
<u>Native Uplands</u>	<u>10 acres</u>	<u>10 acres</u>
<u>Disturbed Uplands and Developed Land</u>	<u>65 acres</u>	<u>62 acres</u>
<i>Sweetwater Marsh Unit Alternative C</i>		
<u>Tidal Wetlands</u>	<u>210 acres</u>	<u>244 acres</u>
<u>Available Nesting Habitat (refer to Section 3.4.4.1 Nesting Seabirds for more details)</u>	<u>32 acres</u>	<u>33 acres</u>
<u>Native Uplands</u>	<u>10 acres</u>	<u>30 acres</u>
<u>Disturbed Uplands and Developed Land</u>	<u>65 acres</u>	<u>10 acres</u>

Table 11 (continued)
Summary of Habitat Changes on the San Diego Bay NWR
under Each Alternative

<u>Habitat Type</u>	<u>Existing Conditions</u> <u>(approximate acreages)</u>	<u>Proposed Conditions</u> <u>(approximate acreages)</u>
<i>South San Diego Bay Unit Alternative C</i>		
<u>Open Water (subtidal)</u>	<u>850 acres</u>	<u>850 acres</u>
<u>Tidal Wetlands</u>	<u>260 acres</u>	<u>520 - 790 acres</u>
<u>Available Habitat for Nesting Birds</u>	<u>100 acres</u>	<u>115 acres²</u>
<u>Native Uplands</u>	<u>2 acres</u>	<u>42 - 62 acres</u>
<u>Existing Salt Ponds (water area only)</u>	<u>960 acres</u>	<u>520 - 815 acres</u>
<u>Freshwater Wetlands</u>	<u>5 acres</u>	<u>15 - 20 acres</u>
<u>Disturbed Uplands</u>	<u>130 acres</u>	<u>0 acres</u>
<i>South San Diego Bay Unit Alternative D</i>		
<u>Open Water (subtidal)</u>	<u>850 acres</u>	<u>850 acres</u>
<u>Tidal Wetlands</u>	<u>260 acres</u>	<u>970 - 1,000 acres</u>
<u>Available Habitat for Nesting Birds</u>	<u>100 acres</u>	<u>130 acres²</u>
<u>Native Uplands</u>	<u>2 acres</u>	<u>42 - 62 acres</u>
<u>Existing Salt Ponds (water area only)</u>	<u>960 acres (commercial salt ponds)</u>	<u>290 acres (converted to managed ponds)</u>
<u>Freshwater Wetlands</u>	<u>5 acres</u>	<u>15 - 20 acres</u>
<u>Disturbed Uplands</u>	<u>130 acres</u>	<u>0 acres</u>

¹ As defined in the 1988 Biological Opinion for this area (*USFWS 1988b*)

² This acreage figure takes into account some loss of nesting area on the breached levees, however, the actual width and location of the levee breaches will be determined during step-down planning.

Appendix A: Alternatives Graphics

List of Figures

- Figure A-1 Sweetwater Marsh Unit, Alternative A
- Figure A-2 Sweetwater Marsh Unit, Alternative B
- Figure A-3 Sweetwater Marsh Unit, Alternative C
- Figure A-4 South San Diego Bay Unit, Alternative A
- Figure A-5 South San Diego Bay Unit, Alternative B
- Figure A-6 South San Diego Bay Unit, Alternative C
- Figure A-7 South San Diego Bay Unit, Alternative C - Otay River Floodplain Restoration
Option 1
- Figure A-8 South San Diego Bay Unit, Alternative C - Otay River Floodplain Restoration
Option 2
- Figure A-9 South San Diego Bay Unit, Alternative C - Salt Works Restoration Option 1
- Figure A-10 South San Diego Bay Unit, Alternative C - Salt Works Restoration Option 2
- Figure A-11 South San Diego Bay Unit, Alternative D
- Figure A-12 South San Diego Bay Unit, Alternative D - Salt Works Restoration Proposal
- Figure A-13 Expected Habitats within the Salt Ponds Following Levee Breaching with No
Change to the Existing Pond Elevations



Figure A-2 Sweetwater Marsh Unit, Alternative B

- Refuge boundary
- Gate/Fencing
- Access road
- Jointly managed least tern nesting site



Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

Carlsbad Field Office - 2003
/stem/stacey/ssdbay/fig_apndx/figures.apr



Figure A-4 South San Diego Bay Unit, Alternative A

Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

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Figure A-6
South San Diego Bay Unit, Alternative C

boating
 fishing
 shoreline fishing
 observation area
 environmental education

N
 0 0.25 0.5 Miles

Source: Local Agency Partnership (2 ft imagery, year 2000)

Carlsbad Field Office - 2003
 /stem/stacey/ssdbay/fig_apndx/figures.apr

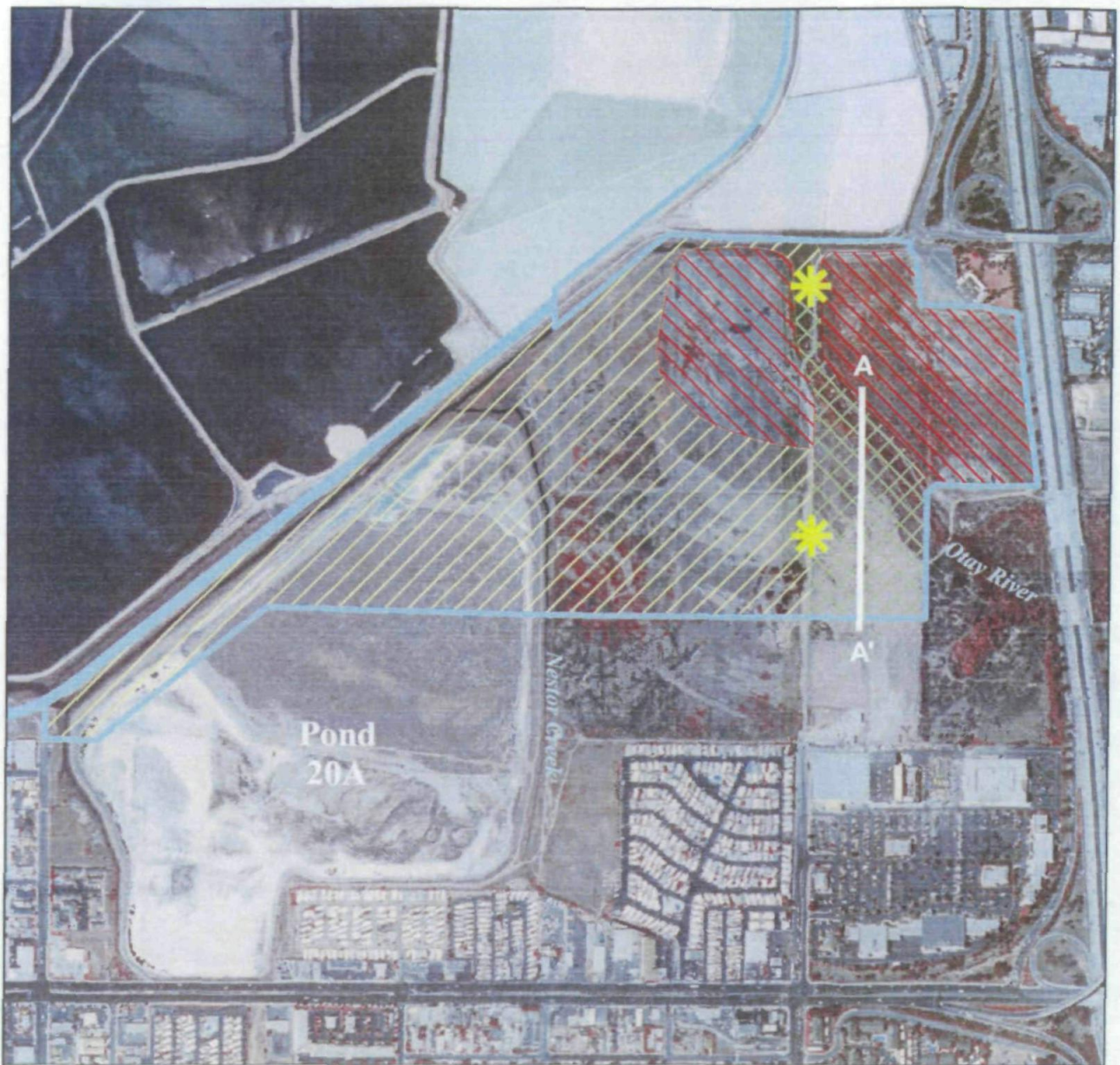





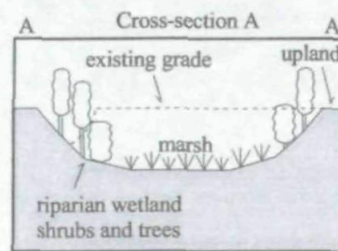


Figure A-8
South San Diego Bay Unit, Alternative C - Otay River Floodplain Restoration Option 2

-  Refuge management boundary
-  Freshwater wetland (70% marsh and 30% riparian)
-  50% intertidal mudflat, 30% cordgrass, 20% pickleweed
-  Restored uplands
-  Transition from freshwater wetland to salt marsh



0.25 0 0.25 Miles











Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

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Figure A-10
South San Diego Bay Unit, Alternative C
Salt Works Restoration Option 2

- | | | | |
|---|---|---|--------------------------|
|  | Levee breach or water control structure (subject to relocation) |  | Proposed salt production |
|  | Filled area for seabird nesting |  | Intertidal mudflat |
|  | Enlarged levee for seabird nesting at selected locations |  | Cordgrass |
|  | Roadbed and levee recontouring with substrate enhancement |  | Salt marsh |

- Note:
- 1- Ponds would be graded to optimize cordgrass habitat for the Light-footed Clapper Rail.
 1. Pond elevations could be altered to achieve desired habitat types.
 2. Existing nesting bird areas are protected and some enhancements are proposed.
 3. Specific locations and sizes of proposed seabird nesting improvements to be determined.
 4. A reduction in the existing salt operation would occur.
 5. Reconfiguration of salt ponds may be necessary to accommodate a reduced operation.
 6. Restoration of the northwest corner of Pond 11, which is owned by the U.S. Navy, would require approval from the Navy prior to implementation.












0.25 0 0.25 Miles

Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

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Figure A-12
South San Diego Bay Unit, Alternative D
Salt Works Restoration Proposal

- | | | | |
|---|---|---|--------------------|
|  | Levee breach or water control structure (subject to relocation) |  | Intertidal mudflat |
|  | Managed brine production |  | Cordgrass |
|  | Managed water area |  | Salt marsh |
|  | Filled area for seabird nesting | | |
|  | Enlarged levee for seabird nesting at selected locations | | |
|  | Roadbed and levee recontouring with substrate enhancement | | |

- Note:
1. Intensive water management for water birds is proposed.
 2. Ponds would be graded to optimize cordgrass habitat for the Light-footed Clapper-Rail.
 2. Pond elevations could be altered to achieve desired habitat types.
 3. Specific locations and sizes of proposed seabird nesting improvements to be determined.
 4. No salt production.
 5. Pond 20 managed for western snowy plover nesting.
 6. Restoration of the northwest corner of Pond 11, which is owned by the U.S. Navy, would require approval from the Navy prior to implementation.



Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

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For Refuge information
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August 2006
Photo: USFWS/J. Konecny

