FINAL

SAN ELIJO LAGOON RESTORATION PROJECT DATA AND INFORMATION GAP ANALYSIS SUMMARY REPORT

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Exhibit 2: San Elijo Lagoon Restoration Project Data and Information Gaps Analysis: Summary Report

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PREFACE

This final Gap Analysis Summary Report incorporates comments made on the draft report submitted to the Lagoon Stakeholders Group in February 2008. A meeting was held on Feb 5, 2008 to present the draft report preliminary findings and solicit comments. Stakeholders present at that meeting included: US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Regional Water Quality Control Board (RWQCB), Caltrans, North County Transit District (NCTD), San Diego Association of Governments (SANDAG), Coastal Conservancy, San Elijo Lagoon Conservancy, and the City of Encinitas.

At that meeting some known data was identified for incorporation into the final report. For example, Doug Gibson at the San Elijo Lagoon Conservancy identified additional sediment sampling and boring data, as well as bathymetry data, that has been collected at the lagoon. That data has been added to the EDAW repository and is reflected in the Final report. Also, the group agreed that development of an Alternatives Development Report would be an appropriate next step to document (via map and text) the variety of lagoon restoration concepts previously considered and the three proposed for more detailed study. This documentation would provide a record of the historic decision-making process and be incorporated into the discussion required under both CEQA and NEPA. That suggested report has been added to this final report as an outstanding data gap.

During the comment period some additional environmental and engineering data was identified as available, but the actual data was not provided to EDAW. For example, both the San Elijo Lagoon Conservancy and Caltrans have, and continue to perform, species surveys, but the results are not collected into the EDAW data set. The final report notes where such data is known to be available but not yet consolidated into a single repository. That consolidation is a data gap.

For the reader's convenience, any text revisions from the draft version are underlined in the body of this Final Summary Report.

1.0 INTRODUCTION

The San Elijo Lagoon Restoration Project (SELRP) brings together various public and private entities that share responsibility to protect, manage, and regulate the San Elijo Lagoon Ecological Reserve. The lagoon is located within the City of Encinitas (Figure 1) and is owned and managed by the State of California (California Department of Fish and Game [CDFG]), the

County of San Diego Department of Parks and Recreation, and the San Elijo Lagoon Conservancy.

The lagoon represents a valuable coastal wetland resource within the San Diego region. The area is the terminus of the Escondido Creek and La Orilla Creek watersheds. The open space provides habitat for sensitive, threatened, and endangered plants as well as resident and migratory wildlife. In addition, the lagoon provides recreational opportunities, including over 5 miles of public hiking trails. Due to encroachment by development, San Elijo Lagoon has gradually been constrained and its ecological function compromised. As illustrated in Figure 2, the lagoon has been traversed by South Coast Highway 101, the North County Transit District (NCTD) railroad, and Interstate 5 (I-5). In addition, development adjacent to the lagoon and upstream within its 77-square-mile watershed has restricted the tidal prism within the lagoon. Such modifications have led to a consistent degradation of the lagoon and water quality of the lagoon and adjacent to the lagoon mouth, leading to beach closures, water quality issues, and bacteria problems. The SELRP is an effort to restore the lagoon functions and values given the historic development and constraints placed on it by these development activities.

While there have been a number of documents and studies focused on improving the biological and hydrologic functions of the lagoon, the San Diego Association of Governments (SANDAG), in coordination with other lagoon stakeholders, has initiated an effort to address the restoration of San Elijo Lagoon using a comprehensive approach. The lagoon stakeholders realize the importance and value of previous studies that have been completed for the lagoon and hope to build upon these to facilitate the development of a comprehensive restoration plan for the lagoon. This Gap Analysis Summary Report (Summary Report) is the initial step in developing that comprehensive restoration plan and maximizing the incorporation of prior information.

One reason the creation of a comprehensive lagoon restoration program is currently becoming more important is the potential implementation of lagoon restoration associated with the proposed improvement of the I-5 transportation corridor. The California Department of Transportation (Caltrans) proposes to widen the existing freeway by adding both general and High Occupancy Vehicle (HOV) lanes, among other improvements under the I-5 North Coast

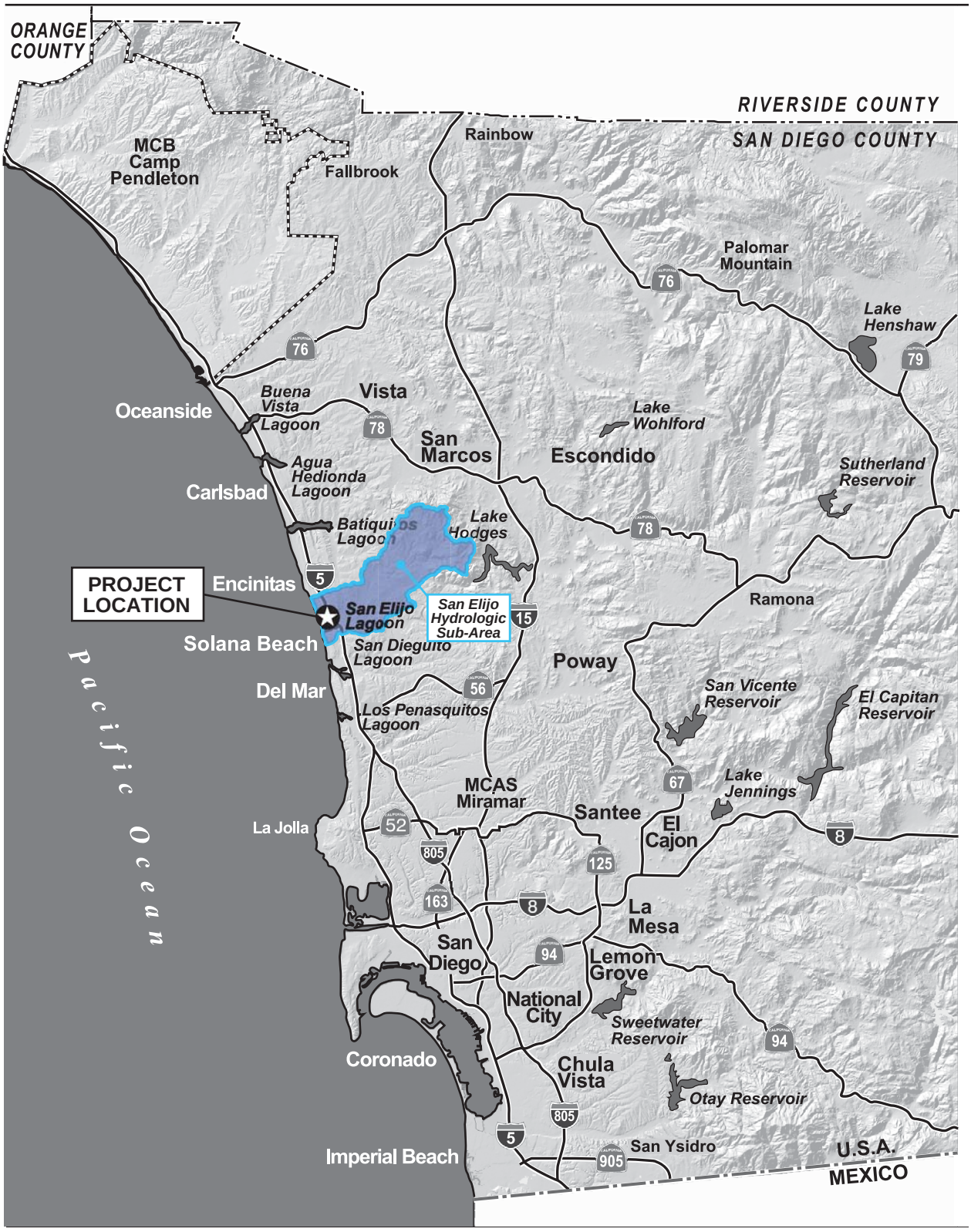

Figure 1
Regional Map

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Source: AirPhotoUSA 2006; SanGIS 2006; County of San Diego 2005; Caltrans 2007

1000 500 0 1000 Feet

Scale: 1:12,000; 1 inch = 1,000 feet

Figure 2
San Elijo Lagoon Ecological Reserve

Path: P:\2008\08080046 San Elijo Lagoon Gap Analysis\5GIS\MXD\Eco Reserve.mxd, 02/04/08, MorenoP

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Corridor Project. This project extends from the City of San Diego north to Oceanside and would impact coastal lagoon resources in San Elijo Lagoon and other locations. Appropriate mitigation would be necessary.

The development of a comprehensive restoration plan for San Elijo Lagoon would facilitate identification of mitigation opportunities to holistically enhance the coastal environment. This ecology-based approach to mitigation is intended to provide the most effective use of mitigation funds to ensure the most critical projects for restoring ecological function of the lagoon are implemented rather than emphasize the fulfillment of mitigation requirements simply based on acreage or ratios. Mitigation for impacts associated with large projects, including, but not necessarily limited to, the I-5 North Coast Corridor Project and grant opportunities for regional coastal restoration efforts (e.g., Proposition 84 grants), could then be based on implementing components of the restoration plan. This lagoon-focused restoration would be similar in concept to the restoration of San Dieguito Lagoon by Southern California Edison as mitigation for impacts from San Onofre Nuclear Power Plant and the restoration of Batiquitos Lagoon by the Port of Los Angeles as mitigation for loss of marine resources in the Outer Los Angeles harbor due to Port construction activities.

The Summary Report identifies existing data and information, as well as data gaps needed to complete coastal engineering and environmental analysis, and anticipated regulatory requirements for the proposed SELRP.

Section 3.0 of this Summary Report specifically addresses the coastal engineering and hydraulic requirements for adequate modeling and development of a comprehensive restoration plan. That plan (assumed to include four alternatives) would be evaluated in a joint environmental document consistent with CEQA and NEPA. Given the project complexity and range of potentially significant issues, that document would be a combined Environmental Impact Statement (EIS)/Environmental Impact Report (EIR). The USFWS would be lead agency under NEPA, and the County of San Diego Parks and Recreation and CDFG would be co-lead agencies under CEQA. The City of Encinitas would assist with the coordination between these and other interested entities.

Section 4.0 addresses the requirements and data gaps for compliance with the environmental process and preparation of the EIS/EIR. This section identifies specific environmental planning components, including alternatives development. For purposes of this data gap exercise and ultimately cost estimating, it is anticipated that existing draft alternatives would be refined and carried forward into the EIR/EIS analysis. Up to four lagoon restoration alternatives based on

existing mapping and proposed habitat acreages are envisioned (including the No Action alternative). Likely permitting requirements are also identified in this section.

Anticipated costs for engineering and environmental clearance are identified in Section 5.0.

2.0 KEY BACKGROUND DOCUMENTS

The SELRP has evolved over a number of years and has involved a number of different stakeholders. Consequently, a series of studies has been prepared addressing various components for restoring San Elijo Lagoon. These efforts, while conscious of each other, have resulted in a dispersed set of reference documents that outline the objectives of the SELRP. Appendix A lists a wide variety of existing documents related to San Elijo Lagoon, including 14 key documents used for the engineering gap analysis. Some of the documents in Appendix A are outdated while others provide some background but do not directly address restoration within the lagoon. Four key documents, listed in Appendix A, have historically defined the SELRP effort to date, including:

- *San Elijo Lagoon Enhancement Plan*, County of San Diego Parks and Recreation Department, 1996

The primary goal of this plan is to "protect, maintain, and enhance the San Elijo Lagoon ecosystem and adjacent uplands in order to perpetuate native flora and fauna characteristics of southern California; to restore and maintain estuarine hydrology." The document identifies a series of objectives designed to attain this goal, including:

1. Open the lagoon mouth regularly or maintain open permanently, to enhance the health and ecological value of the lagoon.

2. Provide a natural gradient of habitats from saltwater marsh in the western end to riparian and upland habitats in the eastern end of the study area. Emphasize restoration of a viable salt marsh system.

3. Design and implement a plan to improve circulation in areas of historical tidal action. Ensure adequate water quality and salinity to maintain the long-term viability of the lagoon habitats.

4. Enhance habitats for native species including rare and endangered species.

5. Avoid the disturbance of cultural resources.

6. Develop public opportunities consistent with resource protection. Develop community education programs about the natural resources of the area.

7. Develop a cost-effective management and maintenance plan for supporting the proposed habitat enhancements.

8. Design and implement a biological and hydrological monitoring program on which to base future decisions and to assess the success of restoration efforts.

9. Improve water quality through restored tidal circulation to reduce (a) impacts to public recreation from beach closures, (b) health risks from high bacteria counts when the lagoon is tidal and the beach is open, and (c) potential for mosquito-borne diseases.

- *San Elijo Lagoon Action Plan*, San Elijo Lagoon Conservancy, 1998

This Action Plan proposed candidate projects to restore the lagoon specific to individual locations within the lagoon. These could become components of a larger restoration program. The Action Plan reflects similar goals and objectives described in the 1996 San Elijo Lagoon Area Enhancement Plan.

- *Draft EIS/EIR for the Encinitas and Solana Beach Shoreline Protection and San Elijo Lagoon Restoration Project*, Army Corps of Engineers (USACE), City of Encinitas and City of Solana Beach, 2002

This preliminary draft document addressed the feasibility of shoreline protection along the Encinitas and Solana Beach coastline, as well as the restoration of San Elijo Lagoon. As an internal document it was not released for public review. It included a description of the baseline environmental conditions, as well as an evaluation of the No Action alternative, but it did not include project descriptions of any build (restoration) alternatives. The 2002 draft EIS/EIR was later modified to remove the lagoon restoration element and a Draft EIS/EIR for the Encinitas and Solana Beach Feasibility Study and Shoreline Protection Project (E-4) was released for public review in 2005. That document evaluated three action alternatives to address beach erosion and storm damage protection along the coastline over a 50-year period. It did not evaluate the restoration of San Elijo Lagoon.

- *Escondido Creek Watershed Restoration Action Strategy*, San Eljio Lagoon Conservancy, 2005

This document prioritized projects within the Escondido Creek watershed, including two focused on San Eljio Lagoon. Project Number 19 includes two conceptual alternatives for restoration within the lagoon, with variations of dredging activities and inlet relocations. These two alternatives, while conceptual, represent the most current comprehensive approach to restoration at the lagoon available for this analysis.

In addition to these key documents, various engineering, design, and environmental studies around and in the San Elijo Lagoon have been completed or are ongoing. For example, the San Elijo Lagoon Conservancy has ongoing, as yet unpublished, environmental research. There are also several planned projects in the vicinity of the lagoon that may have technical studies that could support development of the SELRP, such as the North County Transit District Replacement of Bridge 240.4.

During preparation of this Final Summary Report, additional information has also been identified that could provide further direction on restoration of the lagoon. Appendix B contains GIS mapping for six alternatives that were previously developed as part of a cooperative effort between the USACE, the City of Encinitas, and the San Elijo Lagoon Conservancy. These maps show a series of habitat and open water configurations possible for lagoon restoration. The Appendix also includes a table reflecting existing habitat acreage within the lagoon. Please note that these acreage calculations utilize a different habitat code system than the alternatives mapping, which could present some disconnect during comparison exercises. In addition to these maps, a more recent EIR/EIS has been identified, as well as various Caltrans documents. The set of documents known to exist, but that has not yet been obtained, includes the following:

- EIS/EIR for San Elijo Lagoon, September 17, 2004 (Figures and Tables are a separate file with USACE)
- Final Caltrans Report
- Comments on Caltrans Report
- Responses to Comments
- Summary Field Report July 2004

It is anticipated that the alternatives illustrated in the Appendix B maps represent past efforts by stakeholders to develop potential restoration efforts at the lagoon, and that three of these were previously identified as proposed alternatives to carry forward through the restoration plan and

the EIR/EIS process. The additional documents listed above are anticipated to provide additional information on those specific alternatives, but have not been reviewed for this report.

The four alternatives anticipated in the restoration plan and EIR/EIS are therefore expected to be the No Action alternative plus three of these action alternatives, refined through additional stakeholder, agency, and public input. Because supporting documents for these maps have not been reviewed as part of this Gap Analysis, the extent of current and/or detailed project information is unknown, and costs presented in Section 5.0 are conservative to ensure adequate budget to address issues that may not have been previously addressed.

Considering the existence of additional known information that may provide direction to the SELRP, and the potential that more information may become available for use as a restoration plan is developed, for the purposes of identifying current gaps in the information required to implement comprehensive restoration at the lagoon, this summary report focuses on the four key documents that were reviewed, as summarized above.

3.0. PROJECT DESIGN AND PRELIMINARY ENGINEERING

Development of the SELRP has been completed to a very conceptual level to date. Typically, the steps needed to implement a large-scale wetland restoration project with a new tidal inlet from concept through environmental review (EIS/EIR), permitting, and implementation range from:

- concept-level engineering design to define the project and alternatives,
- preliminary engineering tasks of hydraulics, water quality, sedimentation/shoaling, tidal muting, shoreline effects, maintenance, and
- anticipation and formulation of potential mitigation measures.

This sequential process was followed successfully for the Bolsa Chica Wetland Restoration Project in Orange County throughout the late 1990s and early 2000s. The approach to the SELRP is to analyze the project as a comprehensive, holistic system. The required engineering tasks are conducted in a logical order, with the results of one task required as input for the subsequent tasks, and tasks progressively building upon each other. There can be overlap and head starts for certain tasks to accelerate the pace, but essentially it is an orderly progression of work. Typically, the numerical models are linked in that the results of one modeling effort

become input data to the next. For example, the hydraulic model results automatically feed into the water quality model, and then into the sedimentation model if the models are a "suite" of numerical programs such as the RMA, MIKE, and Delft models.

The assessment of existing studies for San Elijo Lagoon was performed with the Bolsa Chica restoration approach as the standard, understanding that the San Elijo project may be less controversial and therefore necessitate less extensive alternatives development (eight were developed for Bolsa Chica). It is important to adhere to a highly rigorous modeling effort to support preparation of a legally defensible EIS/EIR.

Results of the gap analysis indicate that several tasks and studies still need to be completed to generate sufficient information for developing restoration alternatives for environmental review. Tables 1 and 2, and Appendices A and C show remaining data gaps.

As determined from this list of gaps, the tasks that need to be performed are:

1. Concept Design - Prepare the preliminary design for the proposed project and an appropriate number of alternatives consisting of concept grading plans showing cut and fill, cross-sections, structures (including the tidal inlet and jetties, bridge modifications, shore protection, etc.), quantities, disposal areas, and construction staging and haul routes. Three different topography/bathymetric files exist that may potentially be used for this work They consist of a survey in 1990 as part of a study done by Philip Williams & Associates, a survey in 1993 by the County of San Diego, and a survey in 2000 by Coastal Environments. The areas covered by these surveys, their scale, and degree of accuracy are not known at this time. It is also possible that changes may have occurred at the site since the surveys. As such, it may be wise to perform some degree of analysis of the survey data to identify the most appropriate data available for engineering, and to potentially identify new data that would be needed to fill any gaps.

2. Hydrology/Hydraulic Study - Analyze tidal and storm flood hydraulics (including a bridge scour study) of all options with a suitable numerical model.

3. Water Quality Study - Analyze water quality of all options with a suitable numerical model.

4. Shoaling Study - Analyze sedimentation within the wetland for all options using suitable numerical and/or analytical models.

Table 1
Coastal Engineering Gap Analysis Summary

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
I.	**Proposed Project and Alternatives**		
1.1	Description of the Proposed Project	Final proposed project definition. This section would be prepared based on the ultimate proposed project alternatives.	The preferred Alternative in the feasibility report by Coastal Environmental 2001 was different than alternatives modeled by the USACE in 2006 and Dokken Engineering in 2007.
1.2	Alternatives Carried Forward	Engineering Elements Grading (Cut and Fill) based on existing topography/bathymetry from three different surveys (1990, 1993, and 2000), Construction Methods/Equipment, Disposal Site Options, Access routes and staging areas, Integration with Existing Plans Park Master use plan Monitoring Plan Measures to Minimize Disturbance Restoration Schedule	Bathymetry of proposed alternative area is available in Micro-Station or Autocadd format, but may consist of several different surveys that should be evaluated for completeness and potential gaps.
II.	**Tidal Inlet**		
2.1	Inlet and Jetty Structure Design	Inlet and jetty structure design for final proposed project. Jetty lengths need to be long enough to sufficiently protect the inlet, but not too long to significantly modify longshore sediment transport.	No concepts or analyses available.
2.2	Inlet Dimension Optimization	Inlet dimensions need to be optimized. The inlet cross-section should be large enough to minimize storm flood risk and to achieve tidal circulation needs, but not too large to cause the inlet to become unstable and close due to sedimentation.	No analysis performed.
	Inlet Stability	Inlet stability needs to be analyzed based on tidal hydraulic modeling results, wave climate and tidal prism, etc.	Two alternatives were modeled by the USACE in 2006, but not sufficiently yet for inlet design to be completed.
III.	**Lagoon**		
3.1	Tidal Hydrodynamics and	A tidal hydraulic/hydrology study needs to be	Tidal elevations and inundation conditions.

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
	Muting	done for the final proposed project.	
3.2	Flood Hydraulics and River Sedimentation	Storm flood study need to be done for the final proposed project.	Storm flood elevations and velocities for conveyance and potential scour and erosion.
3.3	Potential Shore Protection and Levee Design	Potential Shore Protection and Levee Design	Scour that occurred along lagoon boundary at Batiquitos Lagoon and Bolsa Chica may also occur here as the site equilibrates.
IV.	**Shoreline Morphology**		
4.1	Shoreline Morphology Modeling Study	Longshore sediment transport modeling is needed to determine potential impacts to the adjacent shoreline of jetties and an inlet; findings may be extrapolated to predict impacts on surfing.	The USACE conducted GENESIS modeling for the Encinitas/Solana Beach Shoreline study. The potential exists to use this model for this project after its modification.
4.2	Beach Sediment Sampling	Grain size information.	Used for modeling.
V.	**Material Disposal Analyses**		
5.1	Sediment Beneficial Uses for Offshore Disposal	Beach and lagoon sand compatibility analyses are required. Update this analysis with beach replenishment sedimentation data (e.g., SANDAG).	Grain size information for the lagoon and nearshore ocean.
5.2	Lagoon Sediment Grain Sizes for Dredging and Reuse	A vibracore study of sediments at depth should confirm the hypothesis that deeper sediments were deposited in an open bay, and are probably primarily composed of medium to fine sand hypothesized by existing literature.	Field exploration and laboratory analyses are needed for both grain size and chemistry. An approved Sampling and Analysis Plan may be required for this work.
5.3	Lagoon Sediment Disposal Options	Lagoon sediment disposal options and plans are needed.	Results of laboratory testing used for design.
VI.	**Maintenance Plan**		
6.1	Lagoon/Inlet Maintenance	A shoaling study of lagoon flood bar development and shoaling rate estimates is needed to enable the dredging frequency analysis.	Results of modeling and shoreline studies used in this design for frequency and quantity.
6.2	Levee and Shore Protection Maintenance	Results of hydraulic modeling are used to determine damage to levees and shore protection.	Model results used to predict damage to protective measures.
VII.	**Water Quality**		
7.1	Water Quality Data	Update with post 2002 water quality data (including TMDL monitoring data); supplement	Used to predict ocean water quality impacts from lagoon and new inlet.

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
		this with 6 weekly groundwater sample data locations, and data from the Conservancy's continuous data logger.	
7.2	Lagoon Circulation Analysis	Perform residence time analyses for tidal flushing.	Provides a first-order indication of water quality from circulation alone.

Table 2
SELRP Coastal Engineering Tasks Summary

Task	Data Needed	Status of Data Availability	Data Collection Needs
Hydraulic Modeling	Existing Ocean Tides; Existing and Proposed Lagoon Bathymetry	Available from Existing Studies as Several Files that Should Potentially be Analyzed	No Additional Data Collection Needed, but Evaluation of Existing Surveys Should Occur to Determine Completeness and Any Potential Gaps.
Water Quality Modeling	Existing Ocean Water Quality; Data from Upstream Sources	Not Available from Existing Studies	Research Through Public Agency Data Files and Websites for Contaminants of Concern
Shoaling Study	Longshore Sediment Transport Data; Hydraulic Model Results; Proposed Lagoon Bathymetry; Recent Lagoon Restoration Results	Combination of Available from Existing Studies and New Data Research Needed	Updated Status of Shoaling at Batiquitos Lagoon, New Data of Shoaling at San Dieguito Lagoon and at Bolsa Chica Wetland.
Tidal Muting Analysis	Results of the Hydraulic and Shoaling Studies	Not Available	Utilize Model Results to Iterate Hydraulic Modeling for New Lagoon Bathymetry
Shoreline Evolution	Existing Wave Data; Existing Longshore Sediment Transport Rates; Existing Beach Profiles; Proposed Jetty Configurations; Proposed Sediment Disposal Plans	Combination of Available from Existing Studies (Input Data for GENESIS by the USACE) and New Data Research Needed	Proposed Jetty Configurations; Proposed Sediment Disposal Plans from Restoration
Maintenance Dredging Requirements	Results of Shoaling and Shoreline Evolution Studies	Not Available	Utilize Modeling Results for Both Studies and Proposed Lagoon Bathymetry to Plan Dredging Frequency, Locations, Quantities, and Disposal Sites
Sand Compatibility Analysis for Material Disposal	Sediment Gradation in the Lagoon and Nearshore Ocean	Not Available, except for shallow depth lagoon sediments (top 3 feet or less) which are very useful, but need to be supplemented with deeper sampling.	Laboratory Results of Grain Size for Samples from the Lagoon and Nearshore Ocean

5. Tidal Muting Study - Analyze tidal muting of all options resulting from wetland sedimentation with a suitable numerical model.

6. Tidal Inlet Stability Study - Analyze the stability of the tidal inlet (i.e., whether it will be self-sustaining and remain open or whether it will periodically close).

7. Shoreline Morphology Study - Quantify shoreline morphology of all options under a range of wave conditions with a suitable numerical model.

8. Maintenance Dredging Study - Determine maintenance dredging needs based on wetland sedimentation.

9. Material Disposal Study - Perform material disposal analyses for sand dredged during construction and maintenance activities.

10. Construction Methods - Describe construction methods, sequencing, and any phasing.

Some of the work that has already been done can be used as background data and a starting point for this list of preliminary engineering tasks, but it does not suffice on its own to satisfy as EIS/EIR Preliminary Engineering Studies. The most significant contributions of the existing studies are the existing data gathered to be available for preliminary engineering, and the set up of hydraulic and shoreline numerical models that can be used to perform the analyses. The technical studies recommended above are required for the EIS/EIR sections as shown in Table 3, which is included in Section 4.

Existing data available for use in analyzing plans for the lagoon are substantially adequate to perform recommended modeling work. The data needed to perform the modeling specified above are shown in the matrix below, with indication of existing data that are able to be used and any new data needed.

Two significant data gaps exist that need to be filled regarding sediment character and quality for assessment of its compatibility. Sediment grain size information for lagoon depositional layers below the top 3 feet within the area to be dredged needs to be obtained using soil borings. Soil borings or vibracores should be taken to depths of approximately 30 feet below grade to provide sufficient data to analyze the potential for an over-dredge pit to be installed for a disposal option. The number of borings depends on the size of the dredge area, the volume, and the variation of lagoon stratigraphy. Approximately 25 to 30 vibracores should be taken at the lagoon, with samples being taken from the borings for laboratory analyses. The data to be obtained are grain

size and bulk chemistry. The results of the data will be used to analyze whether the sediment is suitable for placement at the beach or in the nearshore ocean.

The other data gap that exists is the gradation data for sand in the nearshore ocean that represents the potential receiver site for sand dredged from the lagoon. Sediment samples need to be taken in the nearshore zone from the highest area of the dry beach out to a depth of -30 feet below mean lower low water. A full protocol for sediment sampling is provided in the Sand Compatibility and Opportunistic Use Program prepared by Moffatt & Nichol for SANDAG in 2006. Up to eight samples are taken from the surface of the beach and ocean floor along two shore-normal transects in the vicinity of the placement site. Laboratory testing of the samples is done to create an "envelope" of existing sediment grain sizes within the receiver site for use as the basis for analyses of the compatibility of lagoon sediments placement in the nearshore.

4.0 ENVIRONMENTAL ANALYSIS AND DOCUMENTATION

The environmental gap analysis identifies tasks required to complete the environmental process in compliance with CEQA and NEPA, as well as regulatory coordination required for any proposed restoration project at San Elijo Lagoon. An example outline for a combined EIS/EIR is utilized in Table 3 below to identify specific analyses that would be required under CEQA and NEPA. The outline is based on the Final San Dieguito Wetland Restoration Project EIS/EIR prepared in September 2000 by USFWS as lead agency under NEPA, and The San Dieguito River Park Joint Powers Authority as lead agency under CEQA. The document was referenced by USFWS as an example of a preferred format for a CEQA/NEPA document prepared with USFWS as the federal lead agency. For the purposes of planning the scope of this section, we assume there would be a total of up to four alternatives analyzed in the EIS/EIR, including a No Action alternative. Because the County of San Diego and CDFG are anticipated to be lead agencies under CEQA, their formats and significance thresholds were also used in the development of the outline. Where NEPA and CEQA are different in content and procedure, it was anticipated that the EIS/EIR would use the more stringent analysis to satisfy both.

Alternatives Development Report

The initial step in preparing a comprehensive restoration plan is to define the range of proposed alternatives that would be carried forward through analysis. The process of reaching consensus on the components of a restoration plan would involve substantial coordination and public input.

Table 3
Environmental Document Summary

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
I.	**INTRODUCTION/PROJECT SYNOPSIS**	Prepare using Sections 1.2, 2.2, 2.5, 4.1, and 13. Incorporate by reference existing documents listed in Section 1. Prepare list of all stakeholder meetings and opportunities for public involvement, as well as summary of written comments regarding the project. Identify all local, state, and federal permitting requirements. (Fulfills County CEQA sections: Project Synopsis, Areas of Controversy, and Issues to be Resolved by the Decision-Maker)	Reference each document and alternatives/actions discussed. While the general background of this section would rely primarily on existing information, updates to some sections such as public involvement, purpose and need, and public concerns would be required.
II.	**DESCRIPTION OF THE PROPOSED PROJECT AND ALTERNATIVES**	No existing text. This section would be prepared based on the ultimate proposed project alternatives.	This report assumes up to six alternatives carried forward, and a detailed subsection would be prepared for each of those. This section would address project components, construction methods, management strategies, project schedule, and a monitoring and management plan.
III.	**ENVIRONMENTAL SETTING**		
3.1	Land Use	Update Section 4.11 Land Use, if needed, with current and/or focused land use data.	
3.2	Hydrology/ Coastal Processes/ Water Quality	Update/revise Sections 4.1 and 4.3 per the Hydrology Hydraulic Study, Water Quality Study, Shoaling Study, Tidal Muting Study, Tidal Inlet Stability Study, Shoreline Morphology Study, Maintenance Dredging Study recommended in Section 2. No text exists for climate change and/or sea level rise.	Preparation of new technical studies will require substantial updates/revisions to existing information. Based on USFWS comment (1/14/08), this section will also address climate change and sea level rise, specifically as they relate to the importance of adaptive management.
3.3	Geology/Soils	Utilize Sections 4.1.3 and 4.3.2 for preparation of section. Prepare all subsections per geologic technical studies recommended in Section 2 of this Gap Analysis.	Preparation of new technical study will require substantial updates/revisions to existing information.
3.4	Biological Resources	Section 4.4 to be updated/revised based on proposed Jurisdictional Delineation Report, Biological Technical Report (including protocol surveys not	Some information exists for pocket mouse, light-footed clapper rail, California gnatcatcher, and BSSP near I-5 from surveys conducted by

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
		currently being conducted), and Biological Assessment (BA) recommended in this table.	Caltrans. In addition, SELC is currently conducting surveys for least tern, plover, Belding's sparrow, light-footed clapper rail, fish and invertebrates, and spartina and invasive species. Results of these surveys would be incorporated into the BA and text. Because of the dynamic nature of biological resources and species distribution, updates to the majority of past studies may be required. Preparation of new surveys and studies in areas not covered by these two agencies will still result in some updates/revisions to existing information.
3.5	Natural Resources	No existing text. Use existing land use data for analysis of mineral resources. Utilize Important Farmland and land use data for agricultural analysis.	If potential impacts to mapped FMMP farmland could occur, Natural Resources Conservation Service coordination would be required.
3.6	Landforms and Visual Quality	Utilize Section 4.6 Aesthetics, 4.6.1 Local Policies, 4.6.2 San Elijo Lagoon, and 4.6.1.1 Visual Resource Summary by Coastal Reach for background. Prepare analysis based on technical study recommended.	Previous analysis included four key views; however, with the shift in land use and the presence of sensitive viewer groups, a more focused visual study may be recommended based on the proposed restoration plan components.
3.7	Traffic, Access and Circulation	Utilize Section 4.10 for reference, but update and focus analysis based on recommended technical study.	Assume construction impact analysis only due to potential import/export or haul routes. If a new bridge crossing the lagoon along Pacific Coast Highway is proposed, substantial construction traffic issues would be anticipated. No permanent changes to traffic, access, or are circulation anticipated.
3.8	Air Quality	Update and revise Section 4.7.1 Climate & Meteorology, 4.7.2 Ambient Air Quality with recommended air quality study information.	Air Quality Study recommended due to updates in attainment status and revised regulations. No analysis currently exists regarding potential construction impacts.
3.9	Vectors and Odors	No existing text. Prepare based on Vector Control Program administered by County of San Diego Department of Environmental Health. The recommended Air Quality Technical Study would include an assessment of odors.	Assume County information could be used to assess the state of vectors in the lagoon area and potential effects of the restoration project without a specific focused study.

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
3.10	Public Health/Public Safety	No existing text. Prepare section based on flood hazards, wildlife, creek mouth hazards, and other issues that arise during public scoping.	
3.11	Cultural Resources	Update Section 4.5 with records search and field survey information from Dr. Brian Byrd and Caltrans.	New cultural resources study recommended in this table to update records search and provide more focused surveys for potential cultural resources, depending on location of proposed activities within the lagoon.
3.12	Paleontological Resources	No existing text. Prepare based on Sediment and Geology Study (Foster) and known sensitivity of various formations.	SELC has an existing Sediment and Geology Study that can be used to provide paleontology deposition information. Additionally, boring information from SELC and Caltrans is anticipated to provide additional information sufficient for determining formations underlying the lagoon.
3.13	Utilities/Public Facilities	No existing text. Prepare section based on coordination with various utilities; Caltrans; the County of San Diego; and the cities of San Diego, Solana Beach, and Encinitas.	
3.14	Noise	Update Section 4.8 with new regulations and updated noise study information.	New noise technical study recommended to determine current baseline ambient noise levels in appropriate locations along lagoon. Technical study required in compliance with County requirements.
3.15	Socioeconomics	Reference existing Section 4.9, updated with current SANDAG and economic information.	No separate technical study or social impact assessment would be required.
3.16	Environmental Justice	Reference existing Section 4.9, updated with current SANDAG and economic information.	No separate technical study or social impact assessment would be required.
IV.	**ENVIRONMENTAL CONSEQUENCES & MITIGATION MEASURES**	No impact analysis has previously been completed for build alternatives; therefore, this section would be prepared using primarily new information.	Analysis would be conducted for each alternative. Each issue area would be addressed in the same order as noted in Section III.
V.	**CONSISTENCY WITH ADOPTED PLANS, POLICIES, AND LEGISLATION**	No existing text. Prepare based on current plans and policies that could affect the project area, and assess the major components of the proposed restoration plan for consistency with those plans.	

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
VI.	**CUMULATIVE IMPACTS**	No existing text. Prepare using past, present, and reasonably foreseeable projects in the consideration of the location, jurisdictional resources, type, and size of the project.	
VII.	**GROWTH-INDUCING IMPACTS**	No existing text. Prepare based on CEQA and NEPA guidance.	
VIII.	**RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT & THE MAINTENANCE & ENHANCEMENT OF LONG-TERM PRODUCTIVITY**	No existing text.	
IX.	**UNAVOIDABLE ADVERSE IMPACTS**	No existing text.	
X.	**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES**	No existing text.	
XI.	**LIST OF PREPARERS**	Revise based on preparation of new document.	
XII.	**REFERENCES**	Utilize references from Section 15, as applicable.	
XIII.	**LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED**	No existing text.	
XIV.	**GLOSSARY OF TERMS**	Prepare for new document.	
XV.	**ACRONYMS**	Prepare for new document.	
XVI.	**INDEX**	Prepare for new document.	
RECOMMENDED ENVIRONMENTAL TECHNICAL REPORTS			
Biological Surveys and Reports, Jurisdictional Delineation Report		Update vegetation mapping, plant plot survey, sensitive/rare plant survey, jurisdictional delineation, sensitive wildlife species survey, protocol surveys, and Biological Assessment. Additional information from specific ongoing surveys would be incorporated into the survey reports.	
Visual Quality		Identify key views, conduct visual simulations and analysis based on jurisdictional significance criteria.	
Traffic Impact Study		Survey traffic volumes, take vehicle counts at key locations, project potential temporary and permanent impacts. Use Caltrans, County of San Diego survey and analysis requirements.	
Air Quality Technical Study and Report		Using new County guidelines, a field survey of sensitive noise receptors, baseline conditions, use required methodologies to determine potential temporary and/or permanent impacts.	

Section	Name	Gap and/or Supporting Documents/Sources	Description / Assumptions
Cultural Resources Technical Report		Updated records search, contact Native American organizations, intensive field study, assess eligibility of cultural sites.	
Noise Technical Report		Using new County guidelines, conduct noise study to determine potential temporary and/or permanent impacts.	

Note: References are made to sections of the 2002 draft EIS/EIR as a supporting document/source, where applicable. Recommended technical studies are further detailed in Appendix D.

Preparation of an Alternatives Development Report would document this process and the ultimate alternatives selected for analysis.

The report would include a historic background of alternatives developed to date, including alternatives considered but rejected. In addition, a range of alternatives proposed for restoration would be identified and defined. It is anticipated that three of the six alternatives previously under development by the USACE, City of Encinitas, San Elijo Lagoon Conservancy, and NMFS would form the basis for the alternatives proposed for restoration (see Appendix B). Refinement of these alternatives would require coordination between the current stakeholders to define specific restoration activities and locations. Additional input from public agencies and the public would also be required to refine the alternatives proposed. A series of public workshops, community meetings, and stakeholder coordination discussions is therefore anticipated to complete the process of identifying the range of alternatives to carry forward into the EIS/EIR.

The Report would include a summary of alternatives considered but rejected, which would identify those alternatives that have been considered over the history of the SELRP. The summary would provide documentation of the previous decision-making process and would aid in the preparation of the EIR/EIS discussion required under CEQA and NEPA.

Three build-alternatives are anticipated to be carried forward for evaluation in the restoration plan and EIR/EIS, as noted above. For each alternative, a plot map (in GIS format) would identify restoration activities, including specific proposed habitat type areas and acreages. In addition, each alternative would identify the proposed inlet location and general dredge patterns and frequencies required to maintain the restoration program. The definition of specific alternatives and their inclusion in this document would encourage the evaluation of a set of alternatives reached through consensus of each of the stakeholders involved in the SELRP. Existing mapping has relied on a different habitat coding system than was used for developing the project alternatives reflected in the appendix. Therefore, analysis of the alternatives may require additional mapping of existing habitat to ensure it is consistent with the ultimate proposed restoration alternatives. The summary would also provide documentation of the decision-making process and stakeholder coordination.

EIS/EIR Preparation

Table 3 identifies existing information available for support in completing analysis for the range of issue areas in the anticipated EIS/EIR, and whether additional analysis or new information would be required. The most comprehensive existing documentation available for review during

preparation of this final summary report regarding baseline conditions for the lagoon is the 2002 USACE EIS/EIR. The document is effectively an inventory of studies and analysis of baseline conditions at the lagoon in 2002. While the Affected Environment section of the EIS/EIR to be prepared may rely on this information for reference, the 2002 and pre-2002 data should be updated in most cases due to the sensitive and dynamic nature of resources at San Elijo Lagoon. Where relevant information and/or analysis exists, Table 3 references the specific section of the 2002 EIS/EIR that can be used. Some of the assumptions in the final column of the table better define the parameters of each anticipated analysis. The table also uses assumptions for recommended technical studies, as outlined in Appendix D. Some of those technical studies (i.e., biological and archaeological studies) would incorporate survey information identified, but not yet reviewed. Once the updated 2005 USACE EIS/EIR noted in Section 2 has been reviewed, additional information may be identified that can augment existing studies. Therefore, this table represents a conservative analysis of missing and/or required studies and evaluation. Because a new lead agency would be responsible for preparation of the documents, however, it is still anticipated that the format outlined in Table 3 would be followed. In addition, significance criteria recently established by the County of San Diego must be utilized in the new EIS/EIR.

Regulatory Authorizations/Permitting

Any proposed restoration plan for San Elijo Lagoon would affect sensitive coastal and national resources within a number of jurisdictions. Therefore, extensive coordination and permitting can be anticipated. The probable permitting requirements would involve the following agencies:

- Essential Fish Habitat (EFH) has been designated for a large portion of the lagoon by the 1996 provision to the Magnuson-Stevens Fishery Conservation and Management Act. The 2002 draft EIS/EIR has outlined the designated area in Figure 4.4-19. Staff coordination with the National Marine Fisheries would be undertaken to confirm or amend those boundaries with project year information.

- California Coastal Commission- Section 30600(a) of the California Coastal Act

- County of San Diego Multiple Species Conservation Program (MSCP) (for impacts to a Pre-Approved Mitigation Area [PAMA])

- U.S. Fish and Wildlife Service (Federal Endangered Species Act [FESA] Section 7)

- National Marine Fisheries Service (FESA Section 7)

- California Department of Fish and Game (California Endangered Species Act [CESA] 2081 Incidental Take Permit Application, and possibly Fish and Game Code 1600)

- USACE Section 404 of the Clean Water Act

  The large portion of the lagoon located east of I-5 is a Pre-approved Mitigation Area per the County of San Diego MSCP. For portions of the project located on the west side of I-5 and/or outside of a Regional Conservation Plan area, Section 7 consultation may be necessary to obtain USACE jurisdictional permits for the project.

- Regional Water Quality Control Board (RWQCB) Section 401 of the Clean Water Act

5.0 COSTS TO PERFORM THE WORK

Table 4 outlines the various studies and efforts required to comprehensively define a restoration plan at San Elijo Lagoon, as well as their estimated cost ranges.

Table 4
SELRP Technical Studies, Environmental Document Procedural Tasks, and Estimated Costs

Task/Technical Study	Estimated Cost Range	Estimated Duration
Summary of Alternatives Considered:		
Alternatives Development Report	$20,000-40,000	2-4 months
Public Stakeholder Meeting on Alternatives	$4,000-6,000	
Meeting with Regulatory Agencies (including Coastal Commission) to confirm range of Alternatives	$6,000-8,000	
Total	$30,000-54,000	2-4 months
Environmental Review:		
Public Involvement/Stakeholder Participation	$10,000-20,000	On-going
Draft EIS/EIR Preparation	$175,000-225,000	12-14 months
Final EIS/EIR Preparation	$50,000-150,000	3-5 months
Biological Surveys and Reports (beginning at start of survey window)	$150,000-200,000[1]	Note 2
Jurisdictional Delineation Report	$40,000-60,000	
Visual Quality Study	$75,000-90,000	
Traffic Impact Study	$15,000-20,000	
Air Quality Technical Study and Report	$10,000-15,000	
Cultural Resources Technical Study	$75,000-175,000[2]	

Task/Technical Study	Estimated Cost Range	Estimated Duration
Noise Technical Report	$15,000-20,000	
Total	$615,000-975,000	15-19 months
Regulatory Authorizations/Permitting:		
Permits	$135,000-150,000	12-18 months
Coastal Engineering Review:		
Concept Design	50,000 (including a placeholder of $20,000 for analysis of survey data)	3 months
Soil Investigation for Dredging and Reuse	100,000	4 months (concurrent with design, cumulative period of 4 months,)
Hydrology/Hydraulic Study	50,000	3 months (concurrent with design, cumulative period of 3 months)
Water Quality Study	50,000	3 months (sequential to hydraulics, cumulative period of 6 months)
Shoaling Study	50,000	3 months (sequential to hydraulics but concurrent with water quality, cumulative period of 6 months)
Tidal Muting Study	25,000	1 month (sequential to hydraulics and shoaling, cumulative period of 7 months)
Tidal Inlet Stability Study	25,000	1 month (sequential to hydraulics and shoaling, but concurrent with all others, cumulative period of 7 months)
Shoreline Morphology Study	100,000	5 months (concurrent with all, cumulative period of 5 months)
Maintenance Dredging Study	20,000	1 month (sequential to hydraulics, shoaling, cumulative period of 7 months)
Material Disposal Study	10,000	1 month (sequential to design, cumulative period of 4 months)
Construction Methods	20,000	1 month (sequential to design, cumulative period of 4 months)
Total	$500,000	7 months

[1] Based on EDAW's experience during the I-5/Manchester Interchange Project, information from the San Elijo Lagoon Conservancy, while valuable, did not meet protocol requirements. Therefore, this cost assumption incorporates surveys for potential sensitive species. If surveys are determined to not be required by the agencies, these costs would be adjusted and are expected to decrease by approximately $80,000.

[2] Cultural resources evaluations assume site eligibility testing would be required at up to three sites, but do not include data recovery. If data recovery at 2 sites is anticipated, costs would increase by approximately $300,000.

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APPENDIX A

SAN ELIJO LAGOON RESTORATION PROJECT
LIST OF EXISTING INFORMATION AND DATA

Exhibit 2: San Elijo Lagoon Restoration Project Data and Information Gaps Analysis: Summary Report

Appendix A, San Elijo Lagoon Restoration Project List of Existing Information and Data, is an inventory of documents pertinent to SELRP. It includes technical coastal engineering data and environmental documents for projects in or related to the lagoon.

Background Documents Primarily Used by Moffat & Nichol

A series of documents have been prepared addressing physical coastal conditions in the region and at the site for the SELRP. The documents include:

1. Final EIR/EA for the San Diego Regional Beach Sand Project (RBSP);

2. APPENDICES for the San Diego Regional Beach Sand Project (RBSP) EIR/EA;

3. Feasibility Study and Conceptual Plan for the Relocation of the San Elijo Lagoon Inlet, 2001;

4. Draft EIS/EIR for the Encinitas and Solana Beach Shoreline Protection & San Elijo Lagoon Restoration Project;

5. Encinitas and Solana Beach Shoreline Feasibility Study; Draft Feasibility Report.

6. Draft EIS/EIR for the Encinitas and Solana Beach Feasibility Study and Shoreline Protection Project;

7. Feasibility Study and Conceptual Plan for the Relocation of the San Elijo Lagoon Inlet, 2000, Progress memos 1 through 18, missing pages from number 1, and missing numbers 11, 13, and 16 entirely;

8. City of Encinitas Beach Width Monitoring Program;

9. SANDAG Regional Shoreline Monitoring Program;

10. City of Encinitas, Protection of Hwy 101;

11. San Elijo Lagoon Optimization Study;

12. San Elijo Lagoon Coastal Engineering GIS Data & Reports (on CDs);

13. Draft San Elijo Lagoon Flood Plain Study; and

14. Location Hydraulic Study San Elijo Lagoon.

Each of these studies provides useful and critical information for the specific action being analyzed, but there does not appear to be a comprehensive analysis of the large-scale action of restoring the lagoon. The studies look at a series of individual actions that do not consider the cumulative future proposed condition.

Draft San Elijo Lagoon List of Existing Information and Data

Reference Numbers:
Environmental Document Sources: E-x
Technical & Coastal Engineering Sources: T-x

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
E-1	Final **EIR/EA** for the San Diego Regional Beach Sand Project (RBSP)	SANDAG, US Dept Navy, KEA, MEC, Moffatt and Nichol, GeoArch Marine Archaeology Consultants	June 2000	Project involved placement of 2 mil cubic yards of sand on a maximum of 13 receiver sites. Analyzes two alternatives and a No Action alternative for impacts related to: geology and soils, coastal wetlands, water resources, biological resources, cultural resources, land and water use, aesthetics, socioeconomics, public health and safety, structures and utilities, traffic, air quality, and noise. No long term significant impacts, but a monitoring plan for marine biological resources, lagoons, and underwater archaeological resources would be implemented.	Hard copy, binder Online at: http://www.sandag.cog.ca.us/uploads/publicationid/publicationid_592_1356.pdf	EDAW / City of Encinitas MN Electronic Copy
E-2	Feasibility Study and Conceptual Plan for the Relocation of the San Elijo Lagoon Inlet	Coastal Environments, City of Encinitas	February 28, 2001	Examines three alternatives: Alternative 1 retains the inlet and Hwy 101 bridge in their current positions; Alternative 2 moves the inlet and Hwy 101 bridge south of the existing inlet and north of the restaurants; and Alternative 3 moves the inlet and Hwy 101 bridge south of the sewer outfall pipe. The study addresses 18 reports that covered engineering, hydrology, biology, recreation, economics, and permitting issues. The report summarizes the technical reports and important findings.	http://www.ci.encinitas.ca.us/NR/rdonlyres/B788B77F-7249-4451-9170-DD1ADB1BD413/0/Feasibility_Study.pdf	Online/ MN Electronic Copy
E-3	Draft **EIS/EIR** for the Encinitas and Solana Beach Shoreline Protection & San Elijo Lagoon Restoration Project	USACE, Prepared by MEC Analytical	December 2002	Describes the baseline environmental conditions and consequences of taking no action in the future to remedy shoreline damages or to improve ecological functioning of the lagoon.	Hard Copy in binder and online: http://www.ci.encinitas.ca.us/NR/rdonlyres/105CFB5D-7CEE-43EE-A545-F1D6AEFB1608/0/Environmental_Impact_Stmt.pdf	EDAW Hard Copy/ Online/ MN Electronic Copy
E-4	Draft **EIS/EIR** for the Encinitas and Solana Beach Feasibility Study and Shoreline Protection Project	USACE	August 2005	Addresses alternatives for beach erosion and storm damage protection over a 50 year period. Alternative 1: Beach nourishment. Alternative 2: Beach nourishment with notch fills. Alternative 3: Seawall with notch fills. Also includes a "No Action" alternative. Does not address restoration of San Elijo lagoon.	Hard copy	EDAW hard copy; TOC, Exec summary, Chapter 3

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
E-5	Encinitas and Solana Beach Shoreline Feasibility Study; Draft Feasibility Report.	USACE	August 2005	Considers three alternatives from environmental and economic perspectives to address shoreline stabilization.	http://www.spl.usace.army.mil/cms/files/projects/solana/Encinitas_Solana_Feasibility_Report_Aug_2005.pdf	Online/ MN Electronic Copy
E-6	EIR/EA for the Manchester Ave/I-5 Interchange Project	EDAW	March 2005	Environmental document for the interchange, description of the project setting, alternatives and environmental effects.	EDAW In-house .pdf (Revised preliminary draft, looking for final)	EDAW
E-7	San Elijo Lagoon Action Plan	San Elijo Lagoon Conservancy	1997	The report identifies stakeholders, the environmental conditions, a proposed endowment structure, management plan, a mechanism for long term financial support, and 25 specific projects that will improve the biological productivity of the lagoon	Hard copy, comb bind	EDAW
E-8	San Elijo Lagoon Area Enhancement Plan	County of San Diego, Dept Parks and Rec	1996	The goal of the plan is to recommend methods to preserve and augment a gradient of self-sustaining habitats.	Hard copy, comb bind	EDAW
E-9	Potential Mitigation Opportunities for the I-5 North Coast Project			Appears to have the same text as "I-5 Modeling Report." This study investigates potential mitigation opportunities for the I-5 North Coast project. Investigations looked at how modifications could be made to ACOE design Alternatives to improve circulation, minimize tidal muting, and maximize habitat benefits within the lagoon. Acreage calculations for habitat types were conducted.	http://www.ci.encinitas.ca.us/NR/rdonlyres/8120B602-032C-4C7F-BCD8-E65119B0695C/0/potential_mitigation.pdf	Online/ MN Electronic Copy
E-10	The Escondido Creek Watershed Restoration Action Strategy	The San Elijo Lagoon Conservancy	November 25, 2005	The purpose of the document is to provide background information about the Escondido Creek Watershed for use in watershed analyses, to identify gaps in information, and to use this information to prioritize potential restoration, enhancement and acquisition of natural areas.	Located on the San Elijo Conservancy website: www.sanelijo.org	Online/ MN Electronic Copy
E-11	Shoreline Preservation Strategy	SANDAG	July 1993	The strategy proposes an extensive beach building and maintenance program for the critical shoreline erosion problem areas in the region. It has a set of recommendations on the beach building program, and on financing and implementation.	http://www.sandag.cog.ca.us/uploads/publicationid/publicationid_1256_5880.pdf	Online/ MN Electronic Copy
				Technical & Coastal Engineering Sources		
T-1	APPENDICES Draft EIS/EIR for the Encinitas and Solana Beach Shoreline Protection &	USACE, Prepared by MEC Analytical	Appendix A	Shoreline Background Information: 1. Historical Kelp Persistence Maps 2. US Navy Resource Maps 3. Cardiff and Solana Beach Resource Map 4. MEC and Sea Surveyor Side-scan sonar and dive resource	Hard copy, in binder with Draft EIS/EIR Included in PDF EIR document	EDAW / City of Encinitas/ Online/ MN Electronic

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
	San Elijo Lagoon Restoration Project			maps 5. Commercial Fishermen Edited SANDAG Resource Maps 6. Evaluations of Sensitive Species Determined to be Absent from the Study Area		Copy
			Appendix B	San Elijo Lagoon Background Information: 1. Terrestrial Arthropods of San Elijo Lagoon 2. San Elijo Lagoon Data Sources, References, and Methodology Summary for Avifaunal Assessment 3. Herpetofauna of San Elijo Lagoon Eco Reserve 4. Mammals of San Elijo Lagoon Eco Reserve 5. Avifauna of San Elijo Lagoon Eco Reserve, Cardiff State Beach, and Adjacent Waters 6. San Elijo Monthly Bird Count Totals, Mar.-Nov. 2002 7. Flora of San Elijo Lagoon Ecological Reserve	Hard copy, in binder with Draft EIS/EIR Included in PDF EIR document	EDAW / City of Encinitas Online/ MN Electronic Copy
			Appendix C	San Elijo Lagoon Habitat Evaluation	Bound separately from the Draft EIS/EIR Included in PDF EIR document	Online/ MN Electronic Copy
T-2	Coastal Habitat Study, 2003-2004: Influence of Beach Nourishment on Biological Resources at the beaches in the City of Encinitas, CA	SAIC	January 2005	Looked at changes to biological resources in areas within the City of Encinitas that did and did not receive beach nourishment during the 2001 SANDAG SD Regional Beach Sand project. Includes comparison to 1999 pre-project data.	Hard copy	EDAW hard copy
T-3	Feasibility Study and Conceptual Plan for the Relocation of the San Elijo Lagoon Inlet	Coastal Environments; Oceanographic and Coastal Services	Progress Report #1: February 29, 2000	Project Alternatives. Provides a tentative list of technically feasible alternatives for the relocation of the of the San Elijo Lagoon inlet.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #2: March 13, 2000	Recreation Assessment. Describes existing recreational use, potential recreational impacts and mitigation, due to the relocation of the lagoon inlet.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #3:	Evaluation Procedures. A description of the methodology that will be used to screen possible actions. Screening topics	Hard copy, bound in Feasibility Study binder.	EDAW / City of

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
			April 7, 2000	include aesthetics, air/odors/vectors, cultural resources, biological resources, economics, engineering, recreation and traffic.		Encinitas
			Progress Report #4: May 2000	Overview of Bridge Alternatives. Addresses possible alternatives for the highway and railroad bridges crossing lagoon inlet location alternatives.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #5: May 29, 2000	Beach, lagoon inlet, channels and basins, and highway and railroad topographical surveys.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #6: May 30, 2000	Hydraulic and Sedimentation Study (Part A). Evaluates the hydrologic parameters and design criteria, which can be used to evaluate scour at the bridges.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #7: July 14, 2000	Overview of Engineering Issues Associated with Modifications to the Inlet Location and Highway 101	?	?
			Progress Report #8: June 22, 2000	Cardiff/Oceanside Wave Experiment. It was done to estimate longshore sediment transport in finding the most suitable location for the lagoon inlet.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #9: July 17, 2000	Sediment characteristics of San Elijo Lagoon. Analysis of sediment samples taken from the lagoon to understand the physical and chemical properties of the sand to determine where the excavated or dredged spoil should be placed.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #10: Sept 15, 2000	Dredging Considerations. Dredge spoil disposal protocol is overseen by EPA and ACOE. By characterizing the bedded material, the results can be used to determine appropriate dredging techniques and disposal.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #11: August 4, 2000	Hydraulic and Sedimentation Study, Evaluation of the Existing Conditions (Part B)	?	?
			Progress Report #12: August	Baseline Biological Study: Lagoon Existing Condition. Identifies and quantifies the changes to biological resources resulting from the implementation of the proposed alternatives. Discusses the current conditions of the lagoon and feasibility of	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
			14, 2000	improving those conditions by relocating the lagoon inlet and implementing associated actions.		
			Progress Report #13: Dec 6, 2000	Hydraulic and Sedimentation Study, Evaluation of the Proposed Alternatives (Part C)	?	?
			Progress Report #14: Oct 9, 2000	Proposed Project Elements and Associated Impacts	?	?
			Progress Report #15: Sept 18, 2000	Economic Impact to Businesses	?	?
			Project Report #16:Dec 18, 2000	Optional Wetland Creation and Enhancement Opportunities at San Elijo Lagoon	?	?
			Progress Report #17: Dec 20, 2000	San Elijo Lagoon Project Evaluation. A matrix evaluation was developed to assess the benefits and impacts of potential project alternatives to assist in selecting the project components for the Highway 101 bridge, lagoon, and surrounding development.	Hard copy, bound in Feasibility Study binder.	EDAW / City of Encinitas
			Progress Report #18: Dec 18, 2000	Permitting Workbook	?	?
T-4	Coastal Habitat Study, 2003-2005: Influence of Beach Nourishment on Biological Resources in the City of Encinitas California	SAIC, for the City of Encinitas	June 2006	A coastal habitat study to examine biological resource use of its beaches after sand nourishment from the SANDAG 2001 RBSP. Survey results are compared to 1999 pre-project data evaluated for beach habitat, marine invertebrate resources, bird use of the beaches, and potential grunion spawning habitat.	http://www.ci.encinitas.ca.us/NR/rdonlyres/88F7A580-284A-416F-AB22-CB260BBD2CB6/0/coastal_habitat_study_200305.pdf	Online/ MN Electronic Copy
T-5	City of Encinitas Beach Width Monitoring Program	City of Encinitas	2005-06	The City of Encinitas monitored the beach widths at 34 sites within the cities of Del Mar, Solana Beach, Encinitas, and Oceanside. These bi-weekly monitoring efforts aim to characterize the back beach and analyze both short and long-term changes at these sites located within the Oceanside Littoral	Referred to on this webpage: http://www.ci.encinitas.ca.us/Resident/Environment/CoastZMP/	City of Encinitas Coastal Zone Management Program

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
				Cell.		(MN Electronic Copy of 2005-06)
T-6	SANDAG Regional Shoreline Monitoring Program	SANDAG	2005-06	Yearly monitoring reports to measure the change in beach width over time, documenting the benefits of sand replenishment projects, and helping to improve the design and effectiveness of beach fills.	Years 2005 and 2006 available at: http://www.sandag.org/index.asp?projectid=298&fuseaction=projects.detail	Online/ MN Electronic Copy
T-7	"City of Encinitas, Protection of Hwy 101"					MN possesses hard copy
T-8	"USACE, Geotechnical Report"					?
T-9	"San Elijo Lagoon Conservancy Updated Biological Surveys"					San Elijo Lagoon Conservancy. Website: www.sanelijo.org
T-10	Coastal Habitat Study Encinitas, CA Draft Report ("City of Encinitas Coastal Reef Study")	MEC Analytical Systems, Inc.	Dec. 2003		http://www.ci.encinitas.ca.us/NR/rdonlyres/08E4DD7C-C0AE-4AD8-8CA1-C5D9CD270AB4/0/coastal_habitat_studyDec2003.pdf	Online/ MN Electronic Copy
T-11	San Elijo Lagoon Optimization Study	Prepared for Caltrans and City of Encinitas and prepared by USACOE	April 2006	Same as item E-9. Seems to be the same info, different title. This is labeled "Final Report"	Hard Copy	City of Encinitas/ EDAW

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
T-12	Estimating Beach Attendance and Calibrating the Beach Counters for the City of Encinitas	Philip King, PhD, Economics Dept. SFSU	February 15, 2006	This study aimed at methodology for calibration of electronic laser counters to estimate attendance at its beaches. They were installed in 2003 at several access points to Encinitas beaches.	http://www.ci.encinitas.ca.us/NR/rdonlyres/DF4482D5-46AA-4515-B4F2-854D40C71FA4/0/RewriteEncintas_Report_Feb_2006.doc	Online/ MN Electronic Copy
T-13	Advanced Planning Studies for the San Elijo Lagoon Improvements	Dokken Engineering, SANDAG	June 2006	Alternatives were designed to span the proposed channel improvements to the San Elijo Lagoon. A cost estimate was organized into two alternatives for the proposed Coast Highway 101 Bridge, NCTD railroad bridge, and the I-5 San Elijo Lagoon Bridge and Undercrossing.	http://www.ci.encinitas.ca.us/NR/rdonlyres/0BC9F6FC-667C-491E-966D-D658739327CC/0/I5_Advanced_Planning.pdf	Online/ MN Electronic Copy
T-14	Interstate 5 Bridge at San Elijo Lagoon Sedimentation Study Report	Dokken and WRECO	November 19, 2006	This study analyzed the sediment transport behavior in the lagoon under the existing condition and under the two alternatives under high flow conditions. A model was used to predict the sediment transport behavior in terms of scour and deposition after a Q-100 event.	http://www.ci.encinitas.ca.us/NR/rdonlyres/432F3A9F-B7F2-4A8E-90C1-4C0114549F25/0/I5_Bridge.pdf	Online/ MN Electronic Copy
T-15	Nonpoint Source Pollution Management Plan for San Elijo Lagoon and Escondido Creek Watershed	USDA Soil Conservation Service	June 1993	The plan was to be used by the San Diego RWQCB to develop an amendment to a Basin Plan, updating the beneficial uses for the lagoon and creek, to define water quality and quantity problems and outline monitoring programs for determining compliance.	http://www.ci.encinitas.ca.us/NR/rdonlyres/7C6DE5A3-EB30-47C3-B8FC-7AF0B0ECFD00/0/SEL.pdf	Online/ MN Electronic Copy
T-16	Escondido Creek Hydrologic Area Project Report	USDA Soil Conservation Service	Sept. 1993		http://www.ci.encinitas.ca.us/NR/rdonlyres/777E5BD6-2DC1-480B-A428-1B3E97867C49/0/Escondido.pdf	Online/ MN Electronic Copy
T-17	San Elijo Lagoon Coastal Engineering GIS Data & Reports	City of Encinitas		Electronic files of San Elijo Lagoon modeling data, including alternatives and	A set of 15 CDs	M&N have City of Encinitas' copy of the disks.

Ref No.	Title	Author	Date / Component	Overview	Format	Location, Owner
T-18	Draft San Elijo Lagoon Flood Plain Study	City of Encinitas	Aug 28, 2002	This study was initiated by Dokken Engineering for the purpose of determining the impacts of constructing a partial tight diamond off-ramp from northbound Interstate-5 to Manchester Avenue in the flood plain of the San Elijo Lagoon as part of the Manchester Ave & Interstate-5 project study report. Results for the study in flood plain increases in SEL due to the proposed project using FEMA data and HEC-RAS software for the hydraulic computations. Appendix A: Cross Section Locations for Existing & Proposed, Appendix B: Topographic Survey from the County of San Diego, Appendix C: Cross-Sections Existing, Proposed, Dredged, Appendix D: Profiles Existing, Proposed, Dredged, Appendix F: Flood Insurance Rate Map	Hard copy, binder	EDAW/City of Encinitas
T-19	Location Hydraulic Study San Elijo Lagoon	Caltrans, prepared by Dokken	November 2006	This study explores two alternatives which aim to increase tidal exchange while also decreasing 100-year flood water surface elevations in SEL.	Hard copy, binder	EDAW/City of Encinitas
T-20	Final Summary Report Grunion Monitoring for the SANDAG Regional Beach Sand Project	SANDAG, prepared by EDAW	January 2002	This study was a part of the biological survey requirements in the monitoring plan for the Final EIR/EA for the Regional Beach Sand Project (SANDAG 2000).	Hard copy & e-copy	EDAW
T-21	APPENDICES for the San Diego Regional Beach Sand Project (RBSP) EIR/EA	SANDAG, US Dept Navy, KEA, MEC, Moffatt and Nichol, GeoArch Marine Archaeology Consultants	Appendix C: March 2000	Shoreline Morphology Study. This study analyzes the fate of the sand placed on receiving beaches for each alternative for environmental review and permitting purposes. Analytical and numerical modeling was used, and sensitive biological resources identified.	Hard copy, comb bind	EDAW / City of Encinitas MN possesses
			Appendix D: March 2000	Evaluation of Impacts to Marine Resources and Water Quality from Dredging of Sands from Offshore Borrow Sites and Beach Replenishment	Hard copy, comb bind	EDAW / City of Encinitas/ MN possesses
T-22	North County Transit District Replacement of Bridge 240.4 studies				?	?

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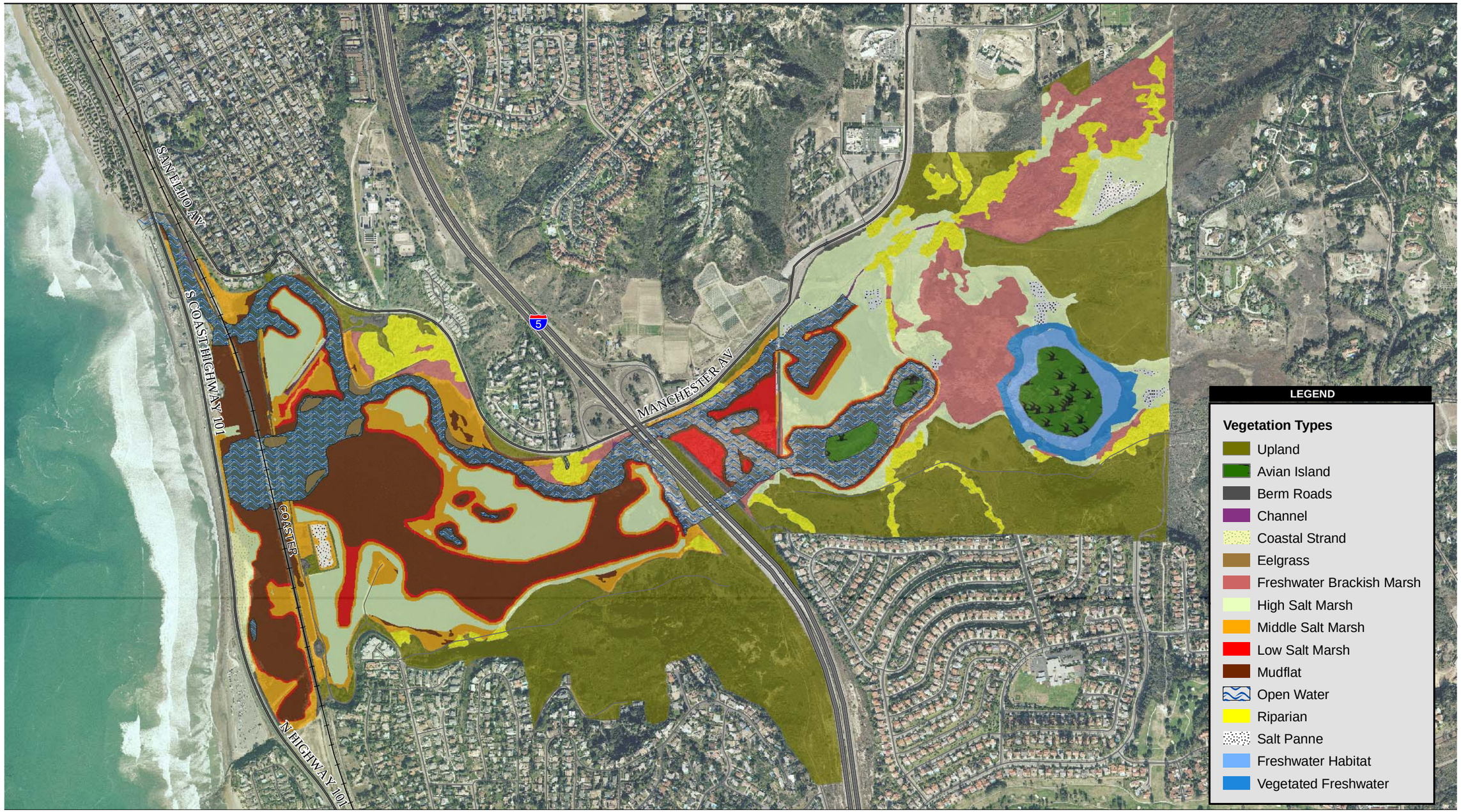
APPENDIX B

SELRP EXISTING ALTERNATIVES – HABITAT MAPPING

San Elijo Lagoon Vegetation

Vegetation Type	Acreage
Alkali Marsh	84.08
Beach	5.14
Brackish Water	5.14
Chaparral	11.74
Cismontane Alkali Marsh	38.85
Coastal and Valley Fresh Water Marsh	116.62
Diegan Coasta Sage Scrub	104.53
Estuarine	150.6
Eucaluptus Woodland	31.64
Non-Native Grassland	42.42
Saltpan/Mudflat	3.46
Southern Coastal Salt Marsh	116.85
Southern Maritime Chaparral	44.48
Southern Riparian Scrub	78.82
Urban Development	41.48
Total	**875.85**



Source: AirPhotoUSA 2006; Moffat Nichol

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Scale: 1:12,000; 1 inch = 1,000 feet

San Elijo Lagoon Restoration Project
Draft Alternative 2 Culvert

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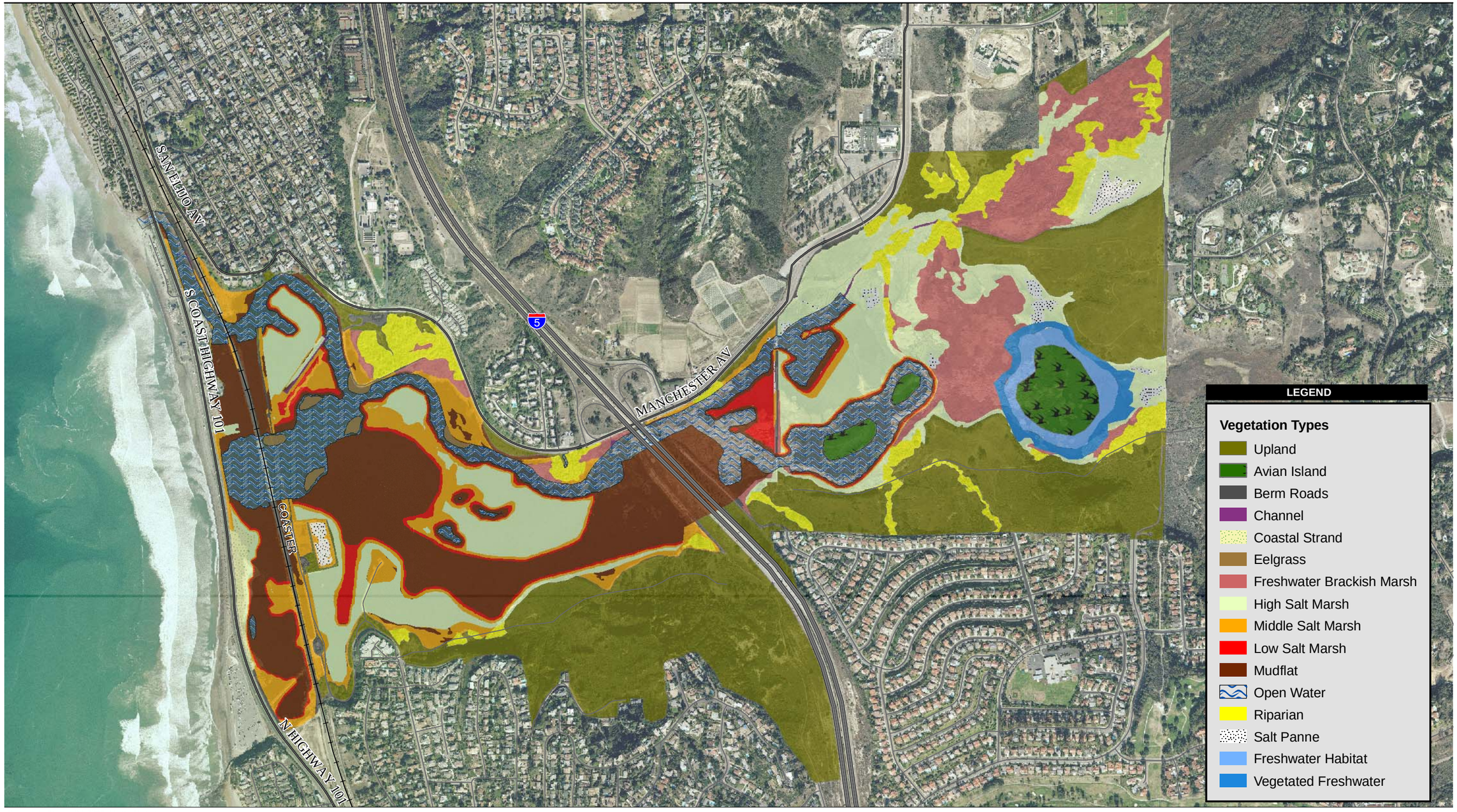

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San Elijo Lagoon Restoration Project
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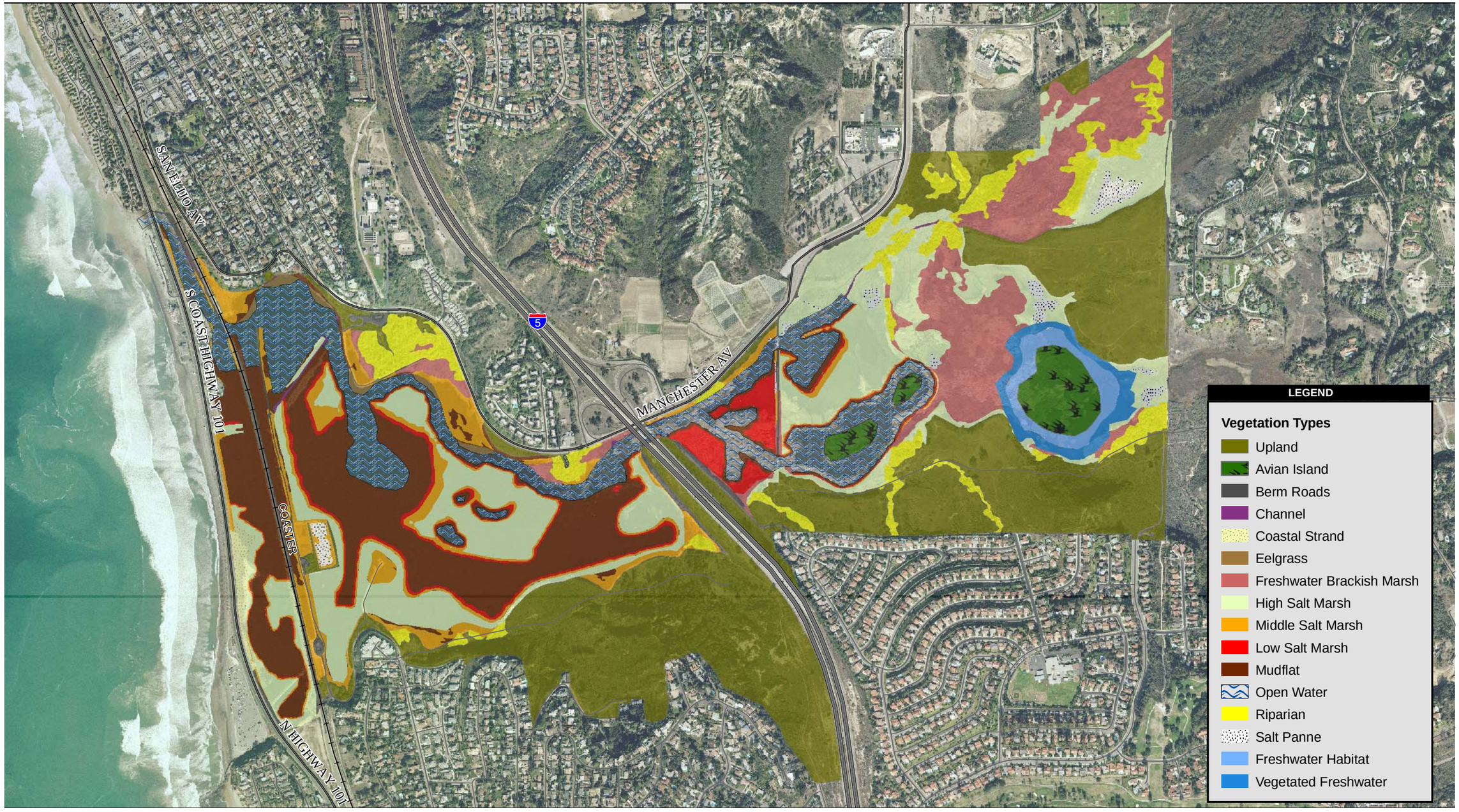

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San Elijo Lagoon Restoration Project
Draft Alternative 140

San Elijo Lagoon Gap Analysis Summary Report

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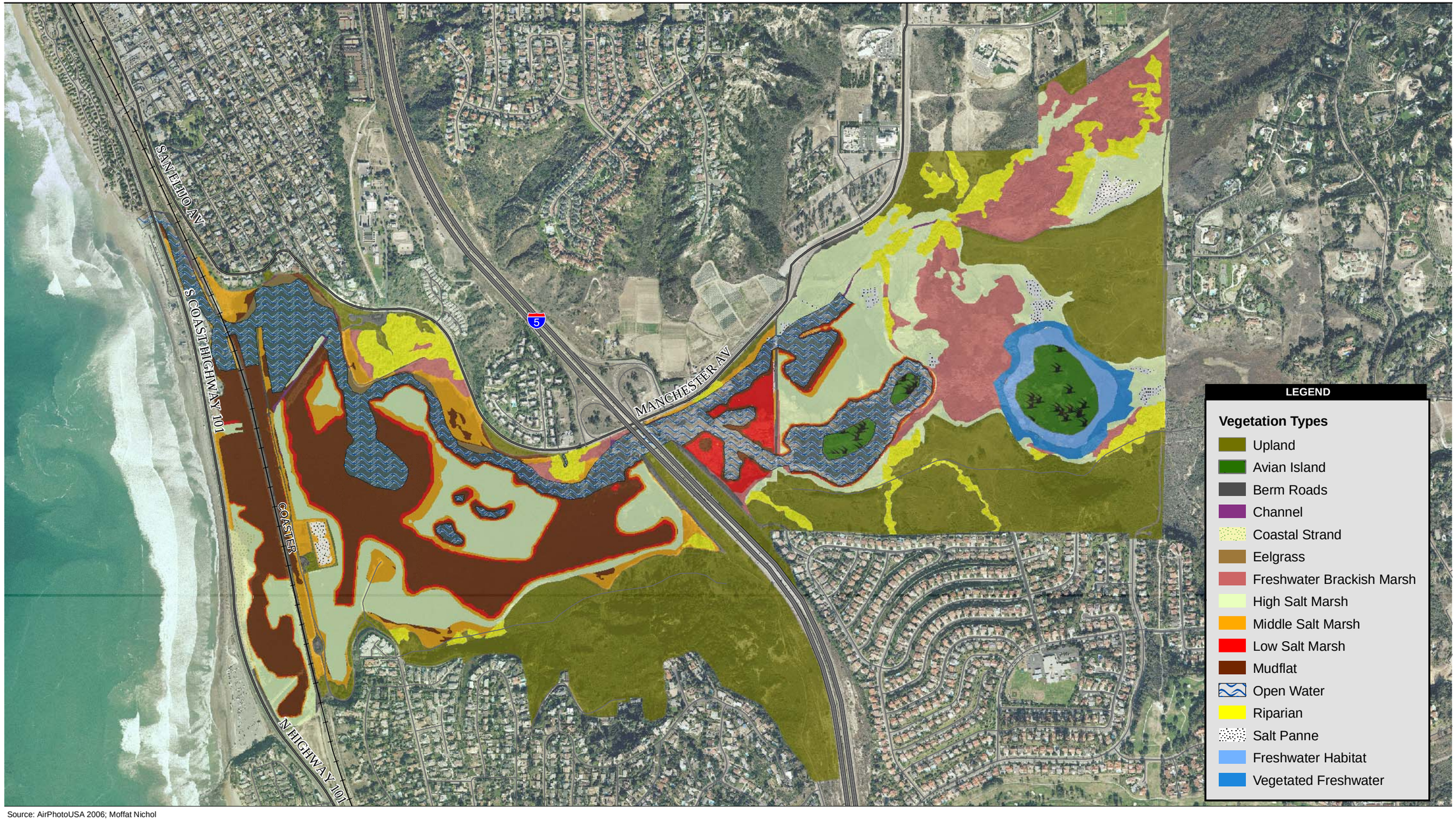

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Scale: 1:12,000; 1 inch = 1,000 feet

San Elijo Lagoon Restoration Project
Draft Alternative 180

San Elijo Lagoon Gap Analysis Summary Report

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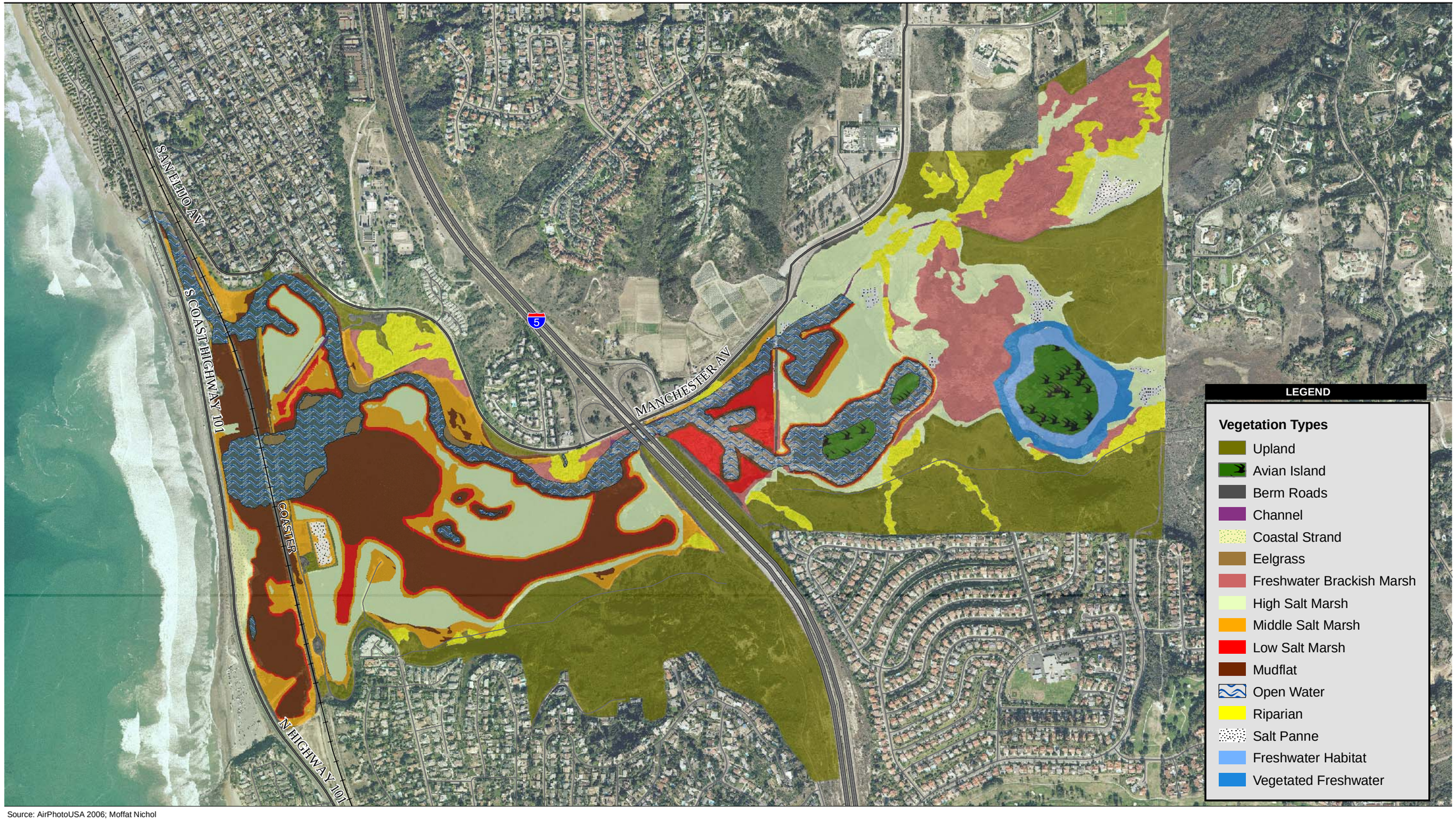

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San Elijo Lagoon Restoration Project
Draft Alternative 240

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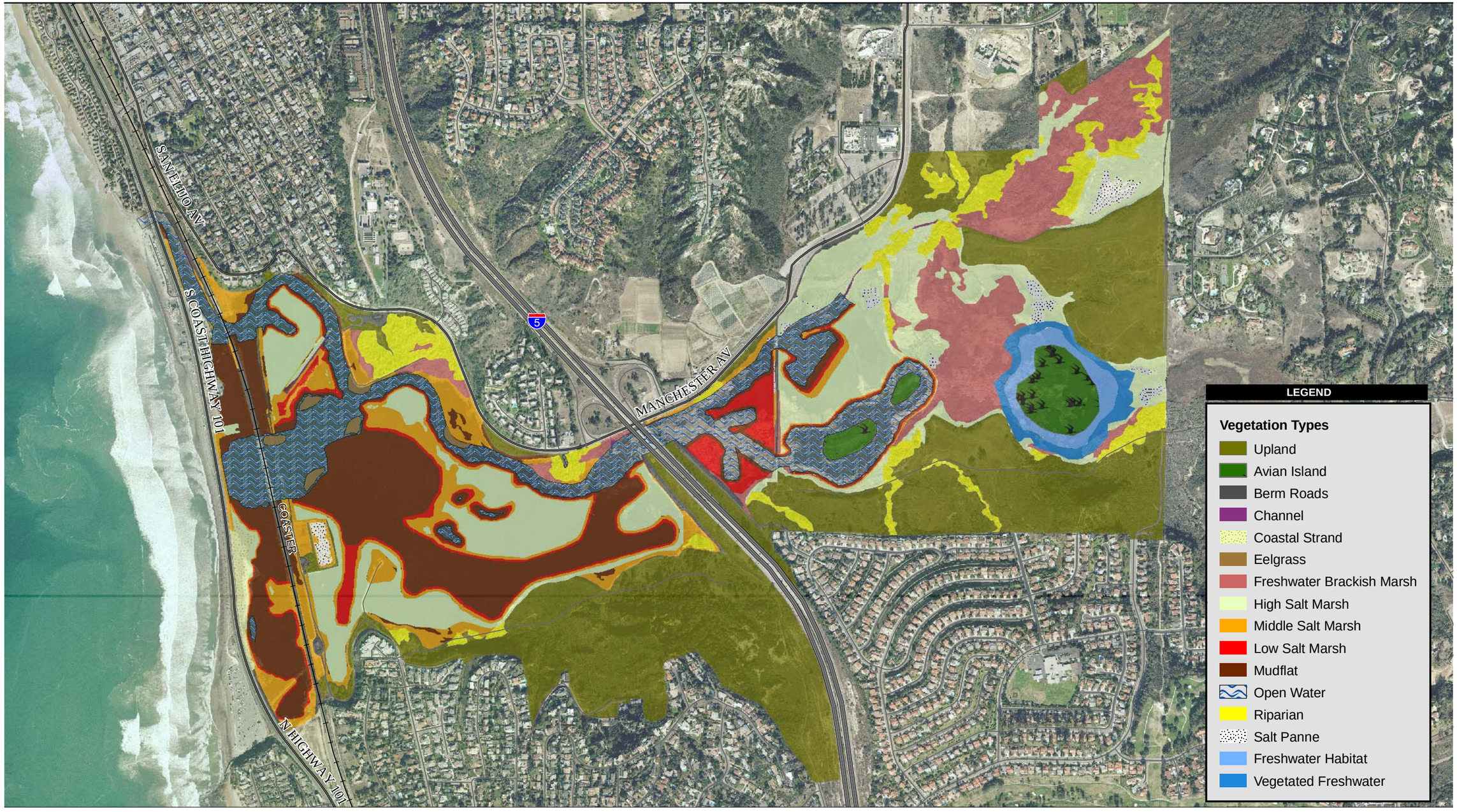

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San Elijo Lagoon Restoration Project
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APPENDIX C

COASTAL TECHNICAL REPORT REVIEW RESULTS

Exhibit 2: San Elijo Lagoon Restoration Project Data and Information Gaps Analysis: Summary Report

DATA USED AND DATA GAP ANALYSIS FOR SAN ELIJO LAGOON, ENCINITAS

Reports reviewed:
Feasibility Study, Coastal Environments, 2001
EIR/EIS for the Encinitas and Solana Beach Shoreline Protection and San Elijo Lagoon Restoration Project
Encinitas and Solana Beach Shoreline Draft Feasibility Study, USACE, Aug 2005

1. Feasibility Study, Coastal Environments, 2001

Assess the feasibility of several projects related to the relocation of the inlet at San Elijo Lagoon.

Data:

Data Type	Time Period	Notes
Lagoon bathymetry	March – May 2000	27 transects traversing the west basin, central basin, and inlet channel.
	Historical Bathymetry	From County of SD, 1993
Water Depths in Lagoon		Range from 1-6 ft, MSL (Elwany, et al., 1995 refs)
Beach Profiles	March – April 2000	10 ranges along Cardiff State Beach
Offshore Bathymetry and Hard Substrates	Dec. 1999	Conducted offshore of study area to a depth of 90ft NGVD using DGPS and fathometer. Substrate data also surveyed using side-scan sonar.
Sediment thickness and hard substrate exposure	Dec. 1999	Determined using a sub-bottom profiler (Appendix C for more info)
Beach Sand Thickness	Dec. 1999	Depth of sand covering reef was measured at 6 profiles surveys suing underwater compressed air pressure jet system
Wave	12Jan – 3 Mar 2000	Wave measurements made at 10-m depth at Cardiff and Oceanside to determine correlation between the two sites. Then used historical wave data from Oside.
Lagoon sediments	26 may 2000	Collected 20 sediment samples from within lagoon to determine disposal options

Analysis:

Type	Data Used	Notes
Longshore Sediment Transport	Historical Oceanside wave data adjusted to Cardiff	Used the Oceanside wave record adjusted to Cardiff as outlined above. Used SIO/USACE relation that $I_l=K(EC_n\sin \cos)_b$. 40% South/60%North and Gross = 453,977 cy/yr
LST for Alternatives		"Complicated approaches for computing longshore transport rates for various inlet locations are available, however they would not provide a significantly better estimate of the LTR at various inlet locations, than the one computed at the wave array because of the large range of variability of the longshore rate estimates."

GAPS:

1. No longshore transport modeling was conducted for alternatives (e.g., GENESIS) (either short-term or long-term); LST rate assumed to be the same as existing, based on modified historical wave data.

2. No cross-shore transport modeling to address the changes in the beach profile from the placement of dredged material.

3. No definitive comparison of lagoon sediments to beach sediments to understand compatibility. Only presented lagoon sediment characteristics (grain size, % fines, etc.), not beach sediments. Need to do SCOUP Sediment Compatibility Analysis.

2. Report:

EIR/EIS for the Encinitas and Solana Beach Shoreline Protection and San Elijo Lagoon Restoration Project

Data:

Data Type	Time Period	Notes
Beach Sediments		Referred to SANDAG 2000 testing as part of the RBSP. D_{50} =0.15 to 0.46 mm existing, w/ 0-3%fines. Source sediment was 1-14% fines, with D_{50} 0.12 to 0.87 mm.

The report does not include any modeling or analysis other than looking at the No-Project Alternative.
No adequate sediment compatibility analysis conducted

3. Report:

Encinitas and Solana Beach Shoreline Draft Feasibility Study, USACE, Aug 2005

Data / Analysis:

Data/Analysis Type	Time Period	Notes
GENESIS modeling		GENESIS modeling was conducted for the Shoreline alternatives beach nourishment w/ and w/out toe protection. This model could be used as the base for SEL alternative modeling.

Comments:
The GENESIS modeling only modeled the shoreline alternatives and did not include any changes to the inlet location or configuration.

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APPENDIX D

RECOMMENDED ENVIRONMENTAL TECHNICAL STUDIES

Exhibit 2: San Elijo Lagoon Restoration Project Data and Information Gaps Analysis: Summary Report

RECOMMENDED ENVIRONMENTAL TECHNICAL STUDIES

Biological Surveys and Reports

Although a number of studies were conducted for the draft 2002 EIS/EIR and other projects, the dynamic nature of the lagoon habitat necessitates updated biological surveys and reports to reflect current conditions. SELC and Caltrans have current survey information on pocket mouse, light-footed clapper rail, California gnatcatcher, Belding's savannah sparrow, California least tern, western snowy plover, fish and invertebrates, and spartina and invasive species. These existing surveys may not satisfy protocol requirements for agency coordination or may be localized. Results of these surveys are anticipated to be kept up-to-date and available for incorporation into the technical study.

Updated Vegetation Community Mapping

The vegetation analysis in the 2002 draft EIS/EIR is based upon the 1995 San Elijo Lagoon Ecological Reserve Biological Element for Master Plan/Management prepared by Welker and Patton and habitat mapping and evaluation conducted by SELC personnel, both in 2002. The Escondido Creek Watershed Action Plan (2005) has a generalized vegetation mapping for the lagoon by SELC, KTU&A in 2002 and MEC Analytical in 2003. An updated vegetation community mapping is recommended due to various environmental factors, such as lagoon flows, salinity of the water and soils, and water levels. While the habitat types may not have changed, the acreages and boundaries may have shifted from what was previously mapped, and mapping codes used for existing habitat calculations would need to be consistent with the proposed alternatives mapping. Additionally, one of the intents of the updated vegetation mapping would be to refine the existing generalized vegetation mapping data. The project year mapping would update the number of acres in each terrestrial and aquatic community type by basin. Invasive species would be identified by species, and stands would be mapped.

Plant plot survey

The 2002 draft EIS/EIR analyzed polygons within each habitat type in each basin at the lagoon. Using the habitat types in the updated vegetation community mapping, a project year plant survey would follow a similar methodology and parameters to the existing habitat analysis. Each polygon within the habitat type would be surveyed for (as applicable): number of native genera, number of nonnative genera, number of the strata, percent native cover, patch size, contiguity, percent surrounding disturbed habitat, percent surrounding urban area, percent human disturbance, tidal inundation, elevation of the Mean Low Low Water (MLLW), adjacent location to tidal channel, elevation, percent dry for nesting habitat, and salinity.

Sensitive/Rare Plant Survey

The 2002 draft EIS/EIR used 2002 records from the California Natural Diversity Database (CNDDB), and California Native Plant Society's Electronic Inventory of Rare and Endangered Vascular Plants of California. These sources as well as USFWS and CDFG lists would be

queried for the project year. The habitat would be assessed for each sensitive species' potential to occur. The 2002 draft EIS/EIR Table 4.4-6 would be updated accordingly. Protocol surveys would be performed if required, as determined by the probability of the species' occurrence and ongoing survey efforts.

Jurisdictional Delineation Report

1. A formal jurisdictional delineation for waters of the U.S. and state (including wetlands) is recommended for the SELRP utilizing the latest procedural guidance issued by the agencies (e.g., USACE, CDFG, and CCC) to determine the type, extent, and jurisdictional extent of regulated waters. (The 2002 draft EIS/EIR designated wetland habitat areas by using mapped vegetation types, not USACE procedure.) Once verified by the agencies, the delineation would establish baseline ambient conditions of aquatic and upland habitats within the survey area and contribute in determining success criteria in assessing the stated goals of the restoration project. The jurisdictional delineation would also be utilized for any requisite permitting determined by the resource agencies.

2. A wetland functions and values analysis would be needed to establish baseline conditions. The recommended methods for conducting a wetland functions and values analysis within the survey area would be utilizing the hydrogeomorphic method (HGM) for federal waters and the California Rapid Assessment Method (CRAM) for state waters.

3. Eelgrass habitat surveys, to determine presence, are recommended for the area as the habitat is recognized as a special aquatic site per CFR 230.4340 CFR 230 Section 404(b)(1). Past surveys conducted by Caltrans (Merkel Associates) near I-5 have indicated no eelgrass exists in that portion of the lagoon.

Sensitive Wildlife Species Survey

The 2002 draft EIS/EIR has a compilation of historical and recent observations of herpetofauna, mammals, and bird species found at the lagoon, the most recent by Patton and Welker in 2002. They also mapped the locations of individual sightings and breeding pairs of birds. This updated survey would include a review of CNDDB records, and lists from USFWS and CDFG for the project year.

Listed species found at the lagoon would be recorded and when applicable, surveys would be performed using current protocol or standard survey procedures during appropriate survey periods. For any protocol surveys conducted, documentation to USFWS would be prepared. In 2002, the following listed wildlife species were found at the lagoon: California brown pelican (*Pelecanus occidentalis californicus*), wood stork (*Mycteria amencana*), bald eagle (*Haliaeetus leucocephalus*), California black rail (*Laterallus jamaicensis coturniculus*), light-footed clapper rail (*Rallus longirostris levipes*), sandhill crane (*Grus canadensis*), western snowy plover (*Charadrius alexandrinus nivosus*), California least tern (*Sterna antillarum browni*), southwestern willow flycatcher (*Empidonax trailli extimus*), least Bell's vireo (*Vireo bellii pusillus*), California gnatcatcher (*Polioptila californica*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), in addition to various birds with the CDFG status of

species of concern. Results from ongoing studies being conducted by SELC and Caltrans would also be taken into account.

Fish and Invertebrates Survey

Species, composition and mean fish abundance surveys are a part of the 2002 draft EIS/EIR. Pacific Estuarine Research Lab and SELC participated in the update to a historical survey of abundance and species composition of fish populations in the lagoon. Project year fish surveys would be conducted using current sampling methods, if updated surveys are not available. Species surveyed would include benthic species, including subtidal invertebrates. Existing insect species survey information would be used unless USFWS information indicates there are species likely to occur in the area. During the updated surveys, the presence and general abundance of key invasive aquatic species would be noted.

Biological Assessment

Protocol surveys for USFWS federally listed species present at the lagoon would be conducted during the appropriate time period for those species not already being addressed by protocol-level surveys conducted by SELC and Caltrans. The potential impacts to these species would be addressed in a Biological Assessment (BA) and provide the information necessary to initiate and support consultation under section 7 of the Federal Endangered Species Act (ESA) of 1973, as amended, for the project.

Visual Quality

The 2002 draft EIS/EIR considered vista points along Manchester Avenue, from residential neighborhoods on the north and south sides of the lagoon, and from Highway 101. There was no analysis conducted to consider potential changes to key views, since the document considered only baseline conditions. When project alternatives are developed, a site visit to determine the location and number of key views would be undertaken. Visual simulations of the key views before and after each project alternative would facilitate the assessment of potential impacts to visual quality. It is assumed approximately nine visual simulations would be required. If needed, a Visual Quality Report would include: discussion of existing conditions (landforms, viewsheds, landscape units, and visual character), a discussion of visual quality (various viewer groups would be identified) and identify visual significance of the overall project area. It would identify any scenic environments and/or scenic highways/corridors, regulations, standards, and significance criteria (USFWS, County of San Diego, Coastal Commission, City of Encinitas, City of Solana Beach, etc.), a discussion of design considerations and project features (construction, maintenance post-construction and post-project conditions) and associated impacts.

Traffic Impact Study

The County of San Diego issued new significance criteria and report formats in 2006, and revised them in December 2007. The existing traffic volumes and operating conditions have changed since the 2002 draft EIS/EIR, and new traffic volume data from SANDAG and/or cities

of Encinitas and Solana Beach would be used to consider baseline conditions. For impact analysis, the number of vehicle trips that the project would generate (the trip generation data would also be needed for noise and air quality impact analyses) would be forecast. Temporary (construction) impacts would be assessed using quantified data including exported spoils imported materials such as rip-rap, sand, gravel, ready-mix concrete; to estimate truck trips. The number of workers would also be needed in order to estimate work commute trips. For permanent (operations) impacts, if the project includes improvement of trails for the public enjoyment or other enhancements for passive recreational use, then it would be assumed that the project would generate operations trips. The generation of trips would result in a need for impact analysis of the traffic, as well as an analysis of access and a parking.

It is also recommended to take current traffic counts at key intersections, such as I-5/Manchester Ave. on/off-ramps. This data may be available through Caltrans' I-5 North Coast Corridor Project or surrounding development projects. The County of San Diego, Caltrans, and surrounding jurisdictions may require different methodologies and analyses for potential traffic impacts assessment. When Caltrans roads are involved, such as I-5, Caltrans usually requires a ramp analysis, sometimes a weaving analysis, and at the ramp intersections.

Air Quality Technical Study and Report

In 2007, the County of San Diego issued new guidelines and significance thresholds for assessing air quality. There are new types of analysis that were not required when the 2002 draft EIS/EIR was released. Examples include a quantitative health risk analysis and diesel particulate analysis. Additionally, the ambient air quality standards have changed since the previous document. In 2003, Particulate Matter (PM 2.5) was recognized as a pollutant of concern. Once a project description is developed, the types of activities would be analyzed in an Air Quality Technical Study. Baseline conditions, regional emissions, local pollutant concentrations, odors, and toxic air pollutants would be addressed qualitatively and/or quantitatively. The technical study would include a field survey of sensitive noise receptors, documentation of baseline conditions, analysis of on-site noise generation, analysis of off-site noise generation, analysis of noise to threatened or endangered species, and recommend, as necessary, noise abatement or mitigation that may be required. Traffic trip generation data would be needed for the analysis of impacts to air quality for the project. Odor assessment would be conducted a part of the Air Quality Technical Study and Report.

Cultural Resources Technical Study

The 2002 draft EIS/EIR used results from a South Coast Information Center record search in 1999. A research project within the San Elijo Lagoon in 2001 and 2002 by Dr. Brian Byrd also includes a field survey. If project activities for the SELRP include dredging activities, there is a potential to encounter buried archaeological sites. A cultural resources study and technical report would be required to assess the potential impacts. These activities include:

1. Conduct an updated records search at the South Coastal Information Center and the Museum of Man. The records search would identify known cultural sites in the vicinity of

the project area and portions of the APE that have previously surveyed for cultural resources.

2. Contact the Native American Heritage Commission and local Native American groups to identify concerns regarding the project.

3. Conduct an intensive field survey of areas within the proposed APE that have not been adequately surveyed within the past five years, and which have potential to contain prehistoric or historic archaeological materials (up to 100 acres assumed).

4. Assess the eligibility of any identified cultural sites within the APE for the National Register of Historic Places and the California Register of Historical Resources (up to three sites assumed).

5. Data recovery of any affected sites (up to two sites assumed).

6. Prepare a technical report documenting the results of the cultural studies. Field monitoring would likely be suggested during construction activities if mitigation is required.

The projected scope and costs for cultural resources studies are estimated on the basis of generalized site types and distributions in this region. Because actual costs will depend on the specific numbers, sizes, and content of cultural sites affected by the ultimate proposed project alternatives, the project costs should be reassessed at each stage of the cultural resources studies.

Noise Technical Report

The anticipated noise study would address construction noise only since no facilities that would result in substantially more operational trips are expected to be proposed.

The regulatory setting and criteria for assessing noise has changed since the draft 2002 EIS/EIR. The County of San Diego released new guidelines and significance thresholds for assessing noise data. The previous document used 2002 noise survey results and needs to be updated with project year data. Four noise reading locations were used in 2002, and there are potentially more sensitive noise receptors in and around the lagoon area that should be incorporated into a noise evaluation, depending on the extent of the proposed restoration plan. The noise evaluation would also address potential impacts to sensitive avian species in the lagoon. Twenty four-hour noise level measurements would be required to determine the peak hour of noise and the noise levels during that peak hour. Traffic trip generation data would be required for the analysis of noise impacts for the project.

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