

LOS CERRITOS WETLANDS CONCEPTUAL RESTORATION PLAN



HABITAT ASSESSMENT REPORT

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August 2012

Los Cerritos Wetlands Habitat Assessment Report: Habitat Types & Special Status Species

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1.0 INTRODUCTION

1.1 Project Objective

The objective of this study is to aid the decision making process of the Los Cerritos Wetlands Conceptual Restoration Plan by determining the existing biological conditions of over 500 acres of coastal open space. This report investigates the habitat types and special status species that are present throughout Los Cerritos Wetlands (LCW) and provides information on the current land uses, invasive species, and wildlife corridors.

Los Cerritos Wetlands is a complex conservation effort. To make the restoration picture clearer, this habitat assessment report presents maps of the historical and current habitat types; a list of potentially occurring special status plant and animal species; maps of special status species habitat present on site; and a comprehensive floral and faunal species database. Based on the findings, the report discusses the restoration potential for the different study site subareas.

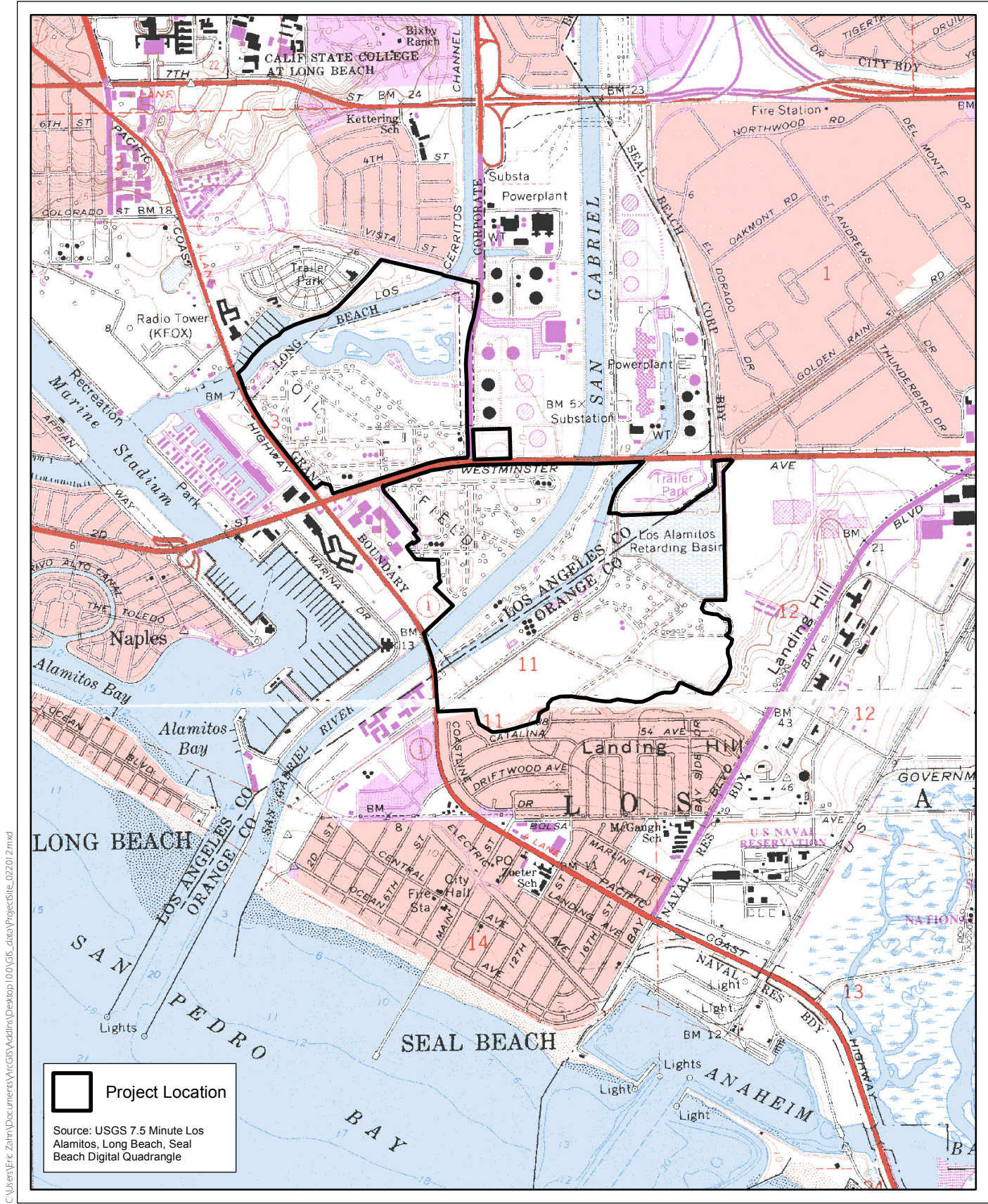
1.2 Study Site

The Los Cerritos Wetlands Conceptual Restoration Plan study site is located in an urban setting and falls within the Cities of Long Beach and Seal Beach, in Los Angeles and Orange County, California (See **Figure 1**). The site supports a complex of wetlands with some tidal connections to Alamitos Bay, just west of Seal Beach National Wildlife Refuge in Anaheim Bay. From a regional ecosystem perspective, the wetland complex is twenty-two miles southeast of the Ballona Wetlands. The historic Wilmington Lagoon once existed five miles to the east of this project site at the mouth of the Los Angeles River, but these coastal wetlands have disappeared and have been replaced by the Ports of Long Beach and Los Angeles.

1.3 Land Ownership

Property within the Los Cerritos Wetlands Complex is held by eleven land owners with four oil leases, and split into even more parcels (**Figure 2**). We have divided the study site into ten sub-areas referred to in this document as LCWA Phase 1, LCWA Phase 2, Marketplace Marsh, Hellman Retained, Bryant Retained, OC Retention Basin, Bixby Ranch Wetlands, Steamshovel Slough, Loynes Parcel, and Haynes Cooling Channel (**Figure 3**).

The study site currently has varying land uses, levels of degradation, and opportunities for habitat restoration.



Project Site

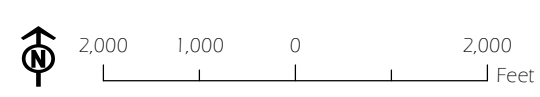
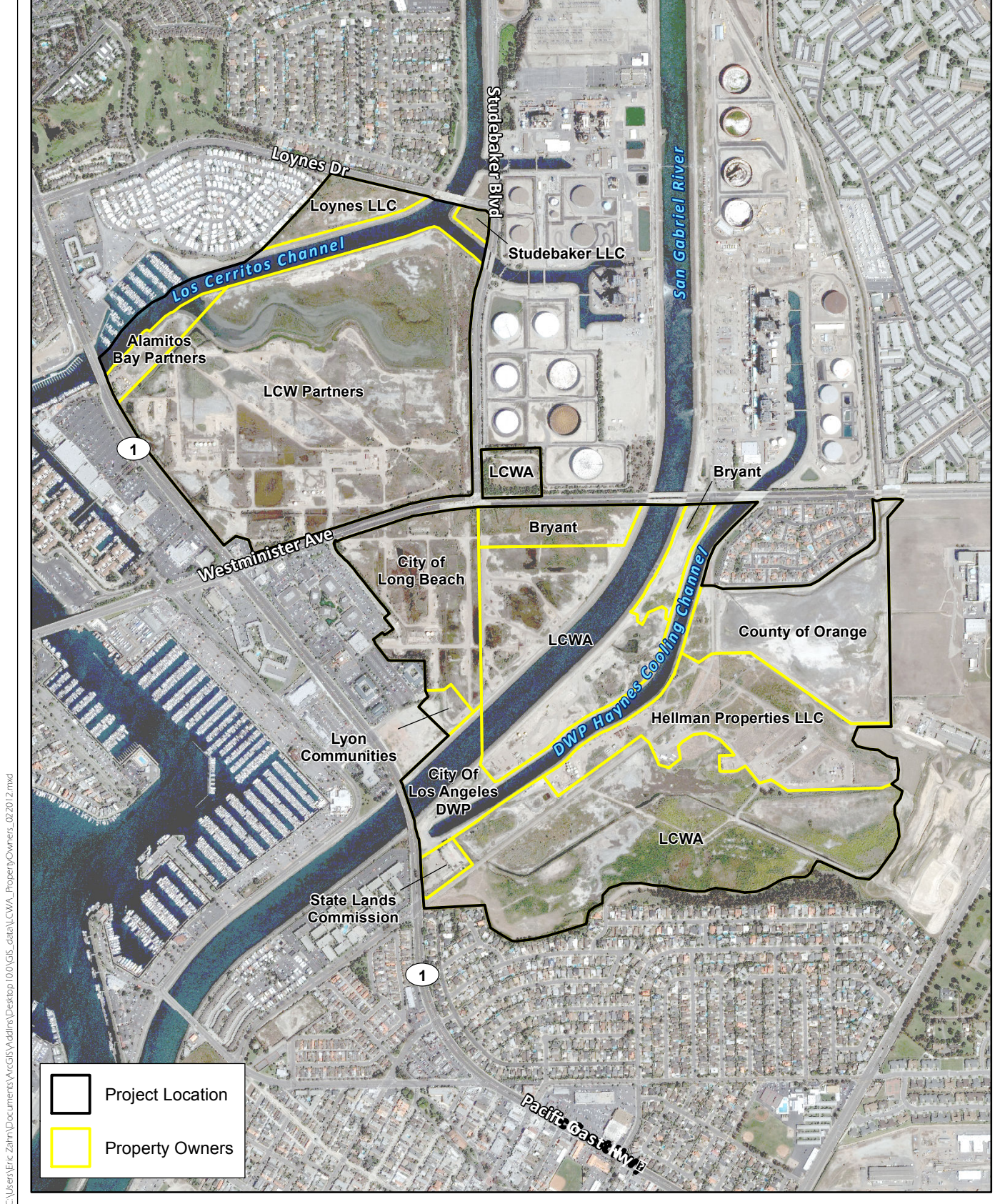


Figure 1: Project Site Location



Los Cerritos Wetlands Conservation Area Property Owners

Figure 2: Property owners within the LCW conservation area

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Los Cerritos Wetlands Sub-Areas

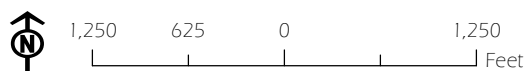


Figure 3: Los Cerritos Wetlands subareas

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1.4 Historical Perspective

The majority of the study site was coastal salt marsh fed by tidal marine water (**Figure 4a&b**). California Department of Fish and Game (CDFG, 1981) says that “As of 1894, the Bay, which was actually the San Gabriel River Estuary, covered about 2400 acres and was composed of flats, salt marsh and tidal lagoons.” This estuarine system was “filled, diked and reshaped” by 1932 and has been in various states of degradation and ecosystem recovery since then (**Table 1**).

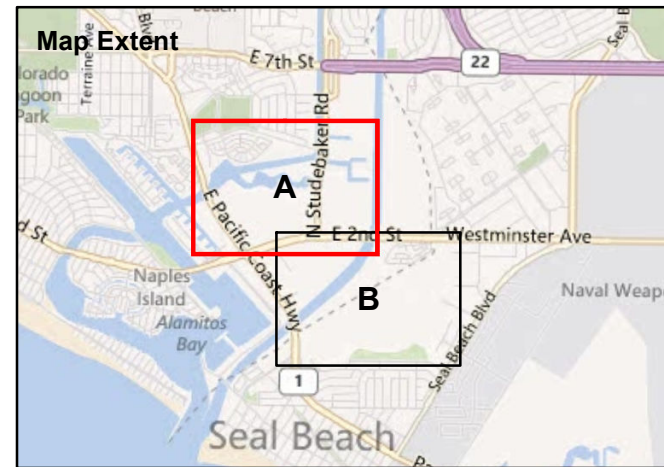
Table 1. Historic habitat type acreage within the study site

Habitat Type	Study Site Historic Acreage	%
Southern Coastal Salt Marsh	466.63	88.5
Southern Coastal Brackish Marsh	2.65	0.5
Alkali Meadow	31.95	6.1
Mulefat Scrub	-	-
Southern Willow Scrub	-	-
Salt Flats	-	-
Subtidal Marine	11.43	2.2
Rip-rap	-	-
Mudflat	14.78	2.8
Ruderal Wetlands	-	-
Ruderal Uplands	-	-
Vegetation Free Zone	-	-
Development	-	-
Total	527.44	100.0

* Habitat acreage data from Grossinger et al., 2011

Salt flats and degraded wetland habitat currently persist in areas that once were tidal. According to historical maps, salt flats were not abundant within Alamitos Bay in 1873, but were extensive during that time in San Pedro Bay at the nearby Wilmington Lagoon (Los Angeles River Estuary; Grossinger et al., 2011). Many of the salt flat areas created by filling and diking have since been exposed to freshwater run-off from surrounding urban areas and have transformed into several palustrine wetland types. This history of landform alteration compounded by maintenance neglect and industrial land uses at Los Cerritos Wetlands has led to the majority of the study site to become ‘degraded habitat.’

This ubiquitous degraded state has lead to the establishment of wetlands habitat type anomalies in areas high in salt content, devoid of tidal influence, and only saturated by seasonal rainfall. Historic disturbances and urban impacts have left all of the existing upland areas degraded with no recognizable native vegetation communities intact. Furthermore, the study site contains purposefully non-vegetated areas as part of mineral extraction operations.



- Map Extent**
- Study Site Boundary**
- Historical Habitat Type**
- Subtidal Water (Subtidal Marine)
 - Intertidal Flat (Mudflat)
 - Vegetated Wetland (Southern Coastal Salt Marsh)
 - Palustrine Marsh (Non-tidal Wetlands)
 - Open Water (Fresh Water)
 - No Data



Historical Habitat

View A

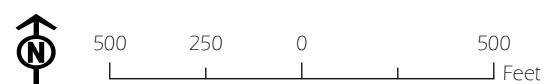
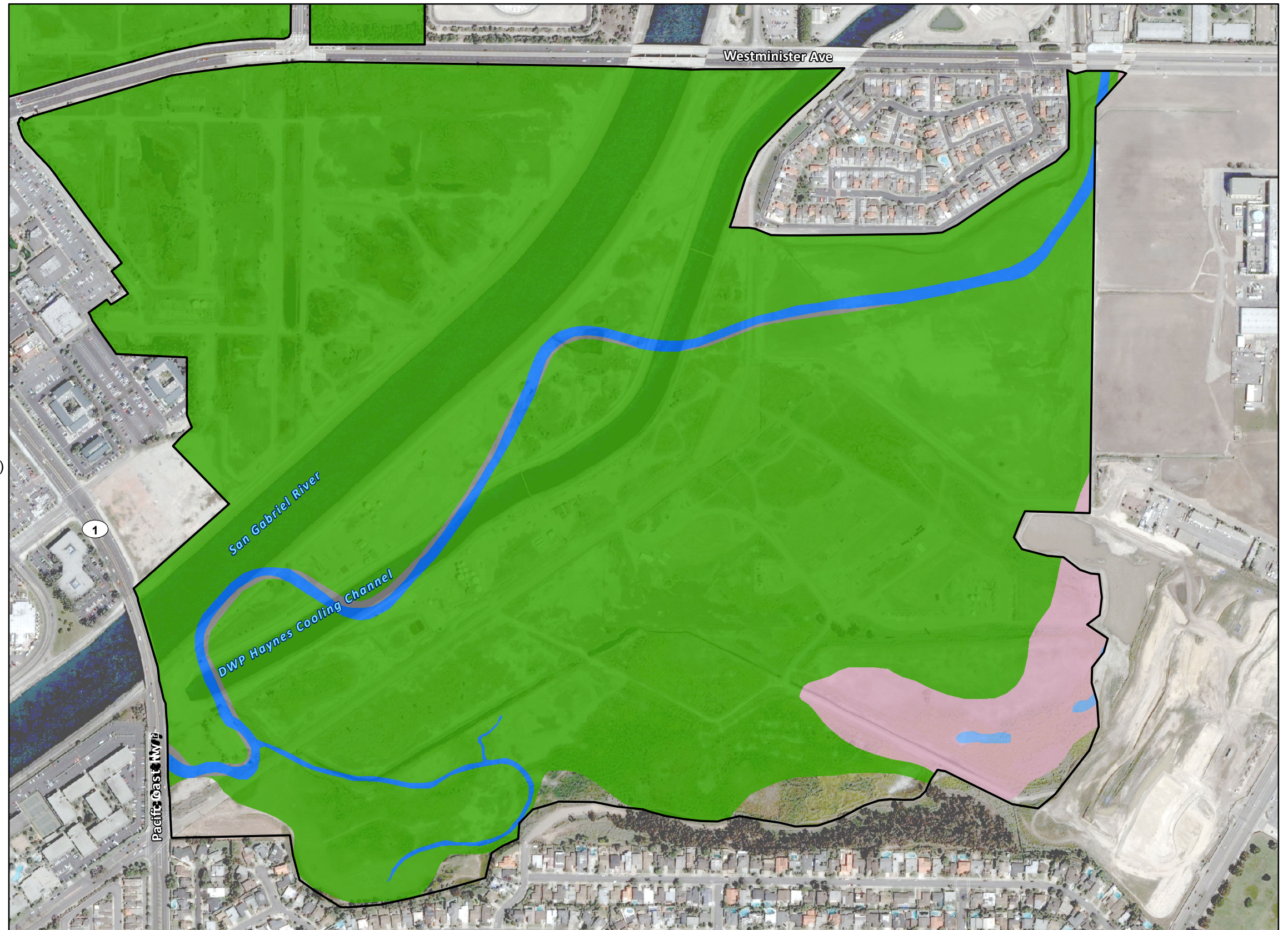
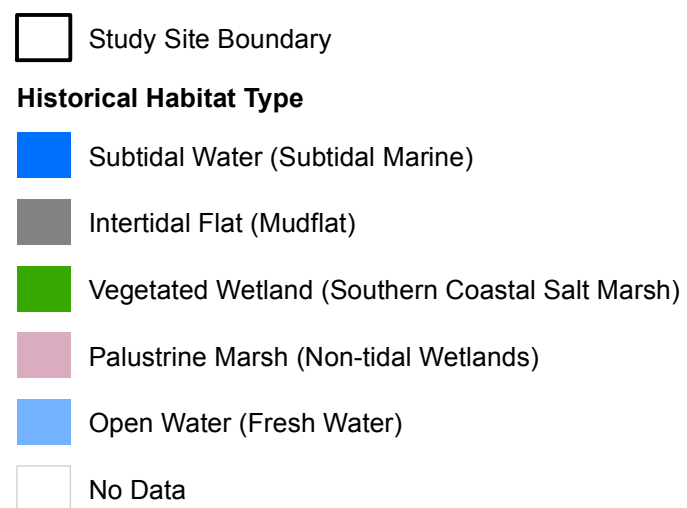
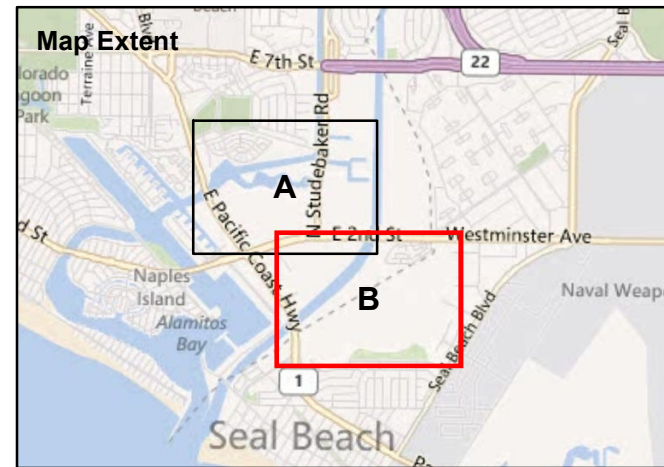
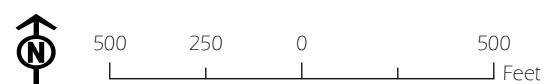


Figure 4a: Historical Habitat types within the study site boundaries north of 2nd Street/West



Historical Habitat

View B



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Figure 4b: Historic habitat types within the study site boundaries south of 2nd St.

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1.5 Methods

Tidal Influence conducted formal habitat assessments throughout Los Cerritos Wetlands between July 2011 and February 2012 (**Table 2**). Nearly 200 acres of publically owned land, as well as the area commonly known as Steamshovel Slough, were surveyed on foot through a series of focused site visits. Additional properties were not accessible during the study period, and were assessed by perimeter surveys, maps and aerial photography.

Table 2. Formal habitat assessment survey dates, personnel conducting field work, and locations

Date	Personnel	Activity	Subareas Surveyed
July 13, 2011	Eric Zahn, Taylor Parker, Dave Hubbard, Matt James	Pre- field analysis of base project, general reconnaissance, and vegetation mapping	MM, LCWA1 &2,
July 14, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	MM, LCWA1 &2, HCC
July 19, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	LCWA1
July 20, 2011	Zahn, Parker and Clark Stevens	Field survey, vegetation mapping and formal habitat assessment fieldwork	MM, LCWA1 &2, HCC, OCRB, Bryant
July 21, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	LCWA1 &2,
December 1, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	BRW
December 6, 2011	Eric Zahn, Taylor Parker, Hubbard and James	Pre- field analysis of expanded project, general reconnaissance, and vegetation mapping	BRW, Slough, Hellman, OCRB
January 25, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	Slough
January 30, 2011	Zahn and Parker	Field survey, vegetation mapping and formal habitat assessment fieldwork	Slough, BRW, Hellman

Habitat maps for Los Cerritos Wetlands were prepared (ArcGIS 10 software) from the ecological data collected on those visits and supported by knowledge gained over years of observations and from relevant biological reports. The habitat maps delineate habitat types and related vegetation communities present on site. When applicable, habitat types were classified in the field according to the identification of established characteristics and vegetation alliances described in Descriptions of the Terrestrial Natural Communities of California (Holland 1986; CDFG 2010). Past biological reports on Los Cerritos Wetlands vegetation communities were referenced to delineate habitat types in instances where anomalies existed that could not be defined with established protocols and definitions.

The location of special status species habitat observed during the surveys, or known from prior investigations, were also mapped. Further details on the methods used to investigate special status species are given in **Section 3**. Lastly, all plant and animal species previously reported or identified during this study's surveys were compiled into a comprehensive Los Cerritos Wetlands Floral and Faunal Database (**Appendix A**).

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2.0 HABITAT TYPES of LOS CERRITOS WETLANDS

Twelve coastal habitat types were identified within the 537.71 acres of Los Cerritos Wetlands studied. Of those, six plant communities were identified: southern coastal salt marsh, southern coastal brackish marsh, southern willow scrub, mule fat scrub, alkali meadow, and eelgrass beds. The other habitat types identified are: intertidal mudflats, salt flats, rip-rap, subtidal marine water (tidal channels and basins), ruderal wetlands, and ruderal uplands. Additionally, vegetation free zones (levees, dirt roadways, perimeters around pumps and pipes, exclusive oil lease easements) and developments (asphalt roadways, abandoned concrete foundations, and active mineral extraction facilities) exist on the site. These vegetation free zones and developments were not considered as habitat types, but are indicated in the habitat maps (**Figure 5a&b**).

In many instances the filled southern coastal salt marsh habitats never recover to form a distinct native plant community but are identifiable as wetlands versus uplands. In this case the areas are either non-vegetated (due to harsh conditions) or vegetated by over 75% of non-native vegetation with no more than one native plant species present. In Los Cerritos Wetlands, invasive plants are widespread and few areas exist where the native plant communities have relatively high species richness and biodiversity without invasive non-native plant species. Further information on invasive plant species is provided below under the each habitat type description.

Photo 1: Vegetation Free Zone

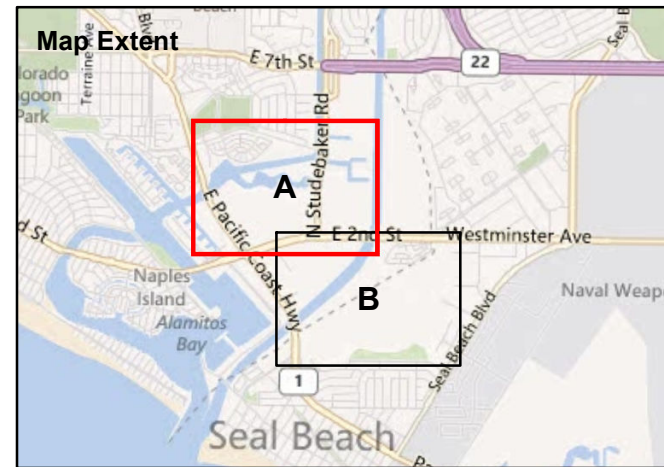


Photo 2: Development

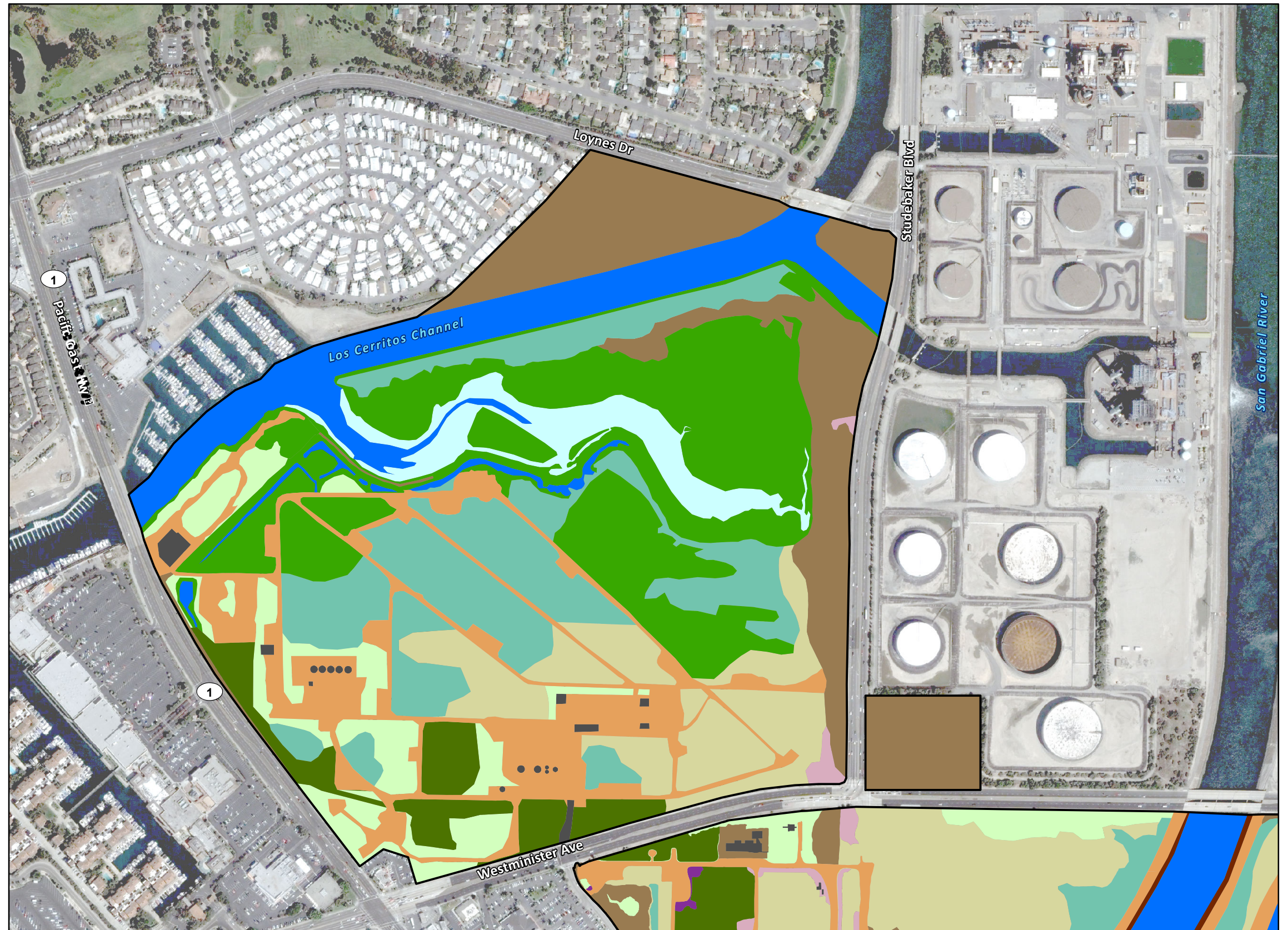


Photo 3: Oil Operations



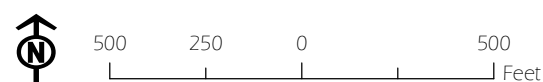


- Map Extent**
- Study Site Boundary**
- Habitat Type**
- Rip-rap
 - Subtidal Marine
 - Mudflat
 - Southern Coastal Salt Marsh
 - Salt Flat
 - Southern Willow Scrub
 - Mulefat Scrub
 - Alkali Meadow
 - Southern Coastal Brackish Marsh
 - Ruderal Wetlands
 - Ruderal Uplands
 - Vegetation Free Zone
 - Development



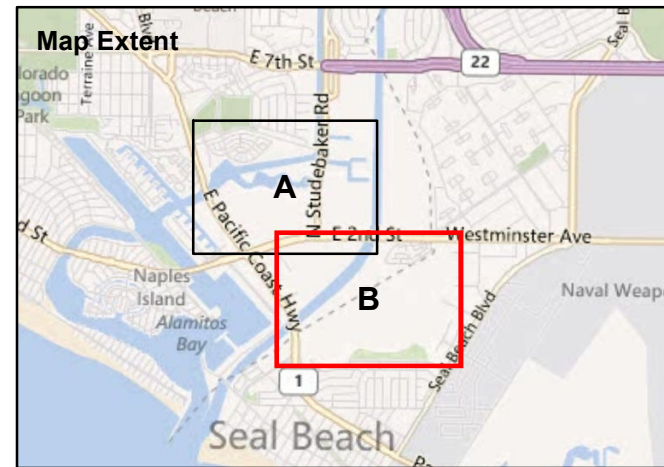
Existing Habitat

View A

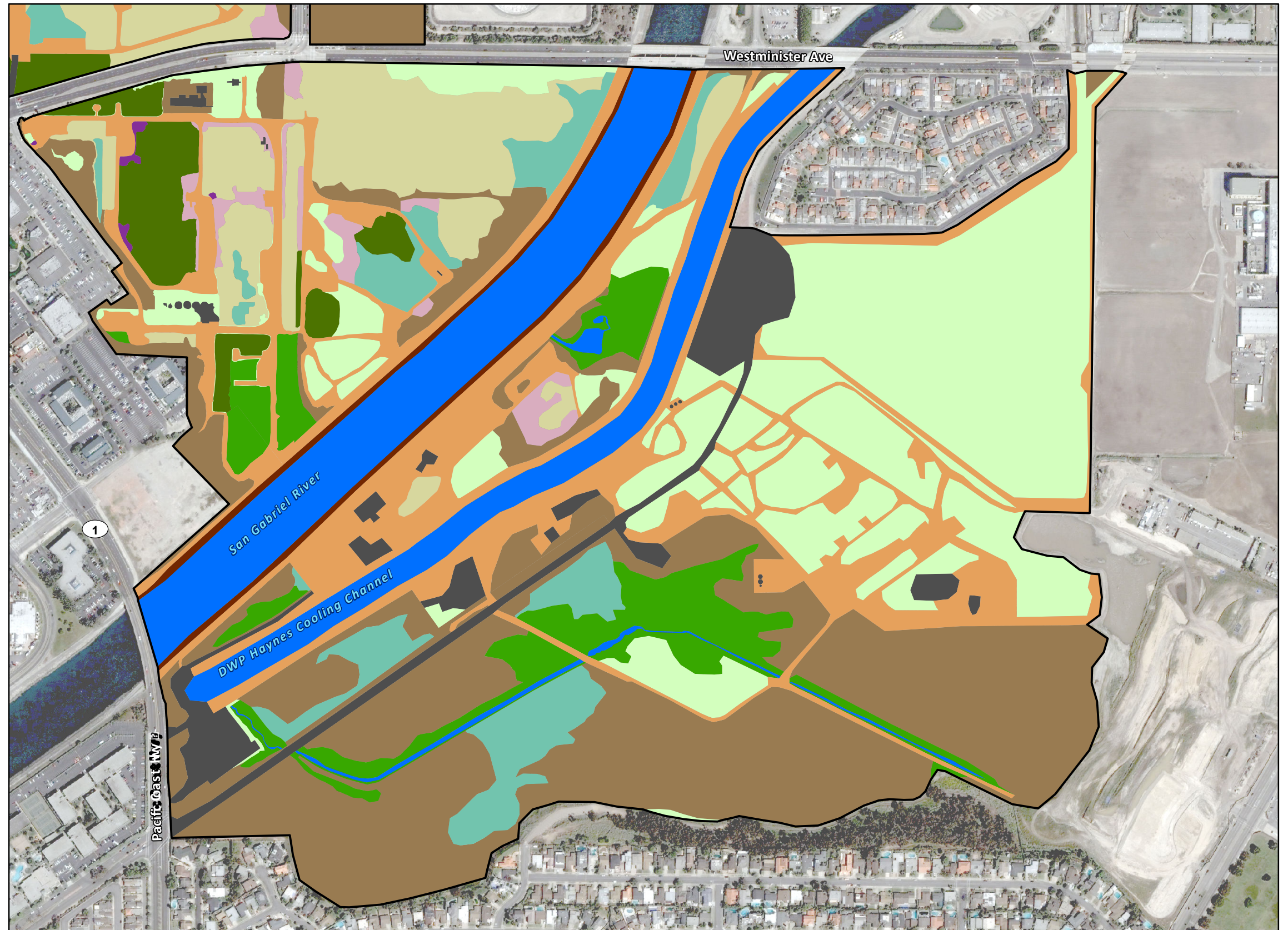


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Figure 5a: Existing habitat types within study site north of 2nd street



- Study Site Boundary**
- Habitat Type**
- Rip-rap
 - Subtidal Marine
 - Mudflat
 - Southern Coastal Salt Marsh
 - Salt Flat
 - Southern Willow Scrub
 - Mulefat Scrub
 - Alkali Meadow
 - Southern Coastal Brackish Marsh
 - Ruderal Wetlands
 - Ruderal Uplands
 - Vegetation Free Zone
 - Development



Existing Habitat

View B

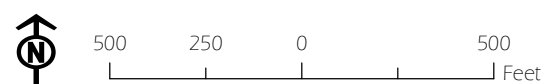


Figure 5b: Existing habitat types south of 2nd street

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The following sections describe each habitat type in detail and are broken into three habitat type categories: 1) Marine Habitat Types; 2) Wetland Habitat Types; and 3) Upland Habitat Types and the acreage of each habitat type is documented for the public land and the entire complex (**Table 3**).

Table 3. The acreage of habitat types at Los Cerritos Wetlands for public land and the entire complex*

Habitat Type	Public Land Acreage	(%)	Entire Complex Acreage	(%)
Southern Coastal Salt Marsh	18.49	8.9	62.76	11.7
Southern Coastal Brackish Marsh	8.99	4.3	17.28	3.2
Alkali Meadow	14.90	7.2	41.40	7.7
Mulefat Scrub	3.87	1.9	4.54	0.8
Southern willow scrub	0.29	0.1	0.29	0.1
Salt Flats	14.35	6.9	47.05	8.8
Subtidal Marine	17.69	8.5	54.77	10.2
Rip-rap	2.82	1.4	3.97	0.7
Mudflat	0.00	0.0	8.42	1.6
Ruderal Wetlands	10.68	5.1	84.94	15.8
Ruderal Uplands	86.44	41.5	118.18	22.0
Vegetation Free Zone	26.20	12.6	78.61	14.6
Development	3.60	1.7	15.50	2.9
Total	208.32	100.0	537.71	100.0

*Data collected by Tidal Influence and adapted from AECOM, 2011

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2.1 Marine Habitat Types

Unaltered coastal wetlands are influenced by the ocean, creating several marine habitat types. These habitats reflect variations in substrate, elevation, wave action, and tidal exposure. The resources and functions of coastal wetlands ecosystems like Los Cerritos Wetlands is a culmination of resources and functions provided by the marine habitat types listed below.

Photo 4: Rip-Rap Habitat pictured on the right

2.1.1 Rip-rap

General Description: This intertidal habitat type is a human-made form of intertidal habitat and is often stratified into three levels (low, middle, and high). This habitat occurs on artificial substrates such as pilings, levees, breakwaters and jetties. The hard substrate supports a variety of red, green, and brown macroalgal species and a variety of mobile and sessile invertebrate organisms.



Characteristic Algal and Plant Species:

Silvetia compressa, *Endocladia muricata*, *Ulva intestinalis* (aka *Enteromorpha*), *Ulva lactuca* (sea lettuce), *Gelidium* spp., *Psuedolithophyllum* spp. (crustose coralline algae), *Colpomenia bullosa* (brown bag algae), *Phyllospadix* spp. (surf grass)

Site Specific Distribution: Historically the San Gabriel River estuary was composed entirely of soft-bottom intertidal substrates. This marine habitat has been introduced to the area with the installation of marine facilities and revetments installed over the past century. This habitat type is represented within this project area along the revetments that lines the San Gabriel River between the P.C.H. and 2nd Street bridges and potentially along the Los Cerritos Channel (although this area was not surveyed). This rip-rap supports low diversity of marine organisms which may be due to high levels of pollutants or freshwater impulses during the wet season.

Ecological Services: Limited undisturbed intertidal habitat exists in southern California. In its degraded state at Los Cerritos Wetlands, this habitat type supports populations of *Ostrea lurida* (Olympia oyster) that are the focus of restoration projects regionally. Their populations have been historically reduced regionally and are important for marine ecosystems since they are filter feeders and have been linked to improved water quality (Polson and Zacherl, 2009). Rip-rap also provide a population source for marine invertebrates that utilize coastal salt marsh habitat like *Pachygrapsus crassipes* (striped shore crab).

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2.1.2 Subtidal Marine

General Description: These are areas along the coast that are perpetually under marine water. In coastal embayment's they are found just below the intertidal zone in tidal basins and channels. The usually soft bottom substrate supports a variety of algal species as well as eelgrass beds.

Characteristic Algal and Plant Species: *Ulva* spp., *Ruppia maritima* (widgeon grass), and *Zostera marina* (eelgrass).

Photo 5: Subtidal marine habitat shown between the San Gabriel River levees



Site Specific Distribution: Due to extensive recreational marine facilities throughout the present-day configuration of Alamitos Bay, subtidal water habitat acreage still rivals what was found historically within the San Gabriel River Estuary. Within the project site, sizable amounts of subtidal marine habitat occurs in the San Gabriel River, Los Cerritos Channel, Haynes Cooling Channel and Steamshovel Slough. These large tidal channels are full tidal but subject to artificial flows associated with power plant cooling. This habitat type is an important aspect of this restoration project. Small tidal channels and basins support subtidal water habitat on the LCWA Phase 1 and 2 properties and the Bixby Ranch Wetlands.

Ecological Services: The subtidal water areas within the project area are suitable for California least tern (*Sterna antillarum browni*) foraging and is deep enough in certain areas to support populations of Pacific Green Sea Turtle (*Chelonia mydas*) and pinnipeds. While surveys for eelgrass populations were not completed as part of this study, this shallow, low-energy, subtidal marine environment may allow for the colonization and persistence of the eelgrass plant community. Migratory fish utilize these inshore subtidal marine waters for breeding, birthing, and as a nursery for juvenile populations.

2.1.3 Eelgrass Beds:

General Description: In southern California this usually submerged plant community is composed entirely of one species of vascular plant, *Zostera marina* (common eelgrass) that grows up to three meters in length. Eelgrass establishes itself best in the muddy or sandy bottoms of shallow, clear, low-energy portions of coastal embayments. Eelgrass cannot survive long-term exposure and therefore are found at the lowest reach of intertidal flats and no deeper than where light can adequately penetrate.

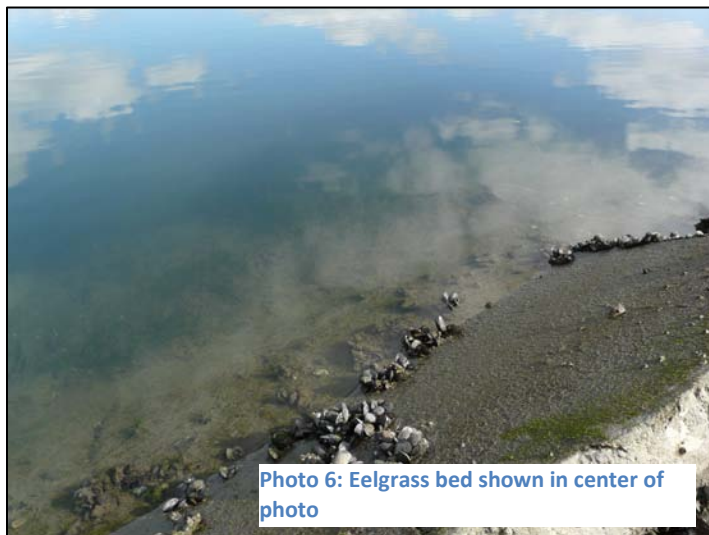


Photo 6: Eelgrass bed shown in center of photo

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Characteristic Algal and Plant Species: *Zostera marina* (common eelgrass).

Site Specific Distribution: Eelgrass has been extensively documented throughout Alamitos Bay, but no surveys have been completed in the San Gabriel River or Haynes Cooling Channel. Eelgrass grows at the mouth of Steamshovel Slough and in the Los Cerritos Channel. The extent of eelgrass habitat was not surveyed or mapped as part of this study. It is not included in the habitat maps and needs further investigation.

Ecological Services: Eelgrass beds are a protected and important ecological community in shallow bays and estuaries because of their multiple biological and physical values. This habitat type functions as an important structural environment for both resident and migratory estuarine animal species, offering both refuge from predation and a food source.

2.1.4 Intertidal Mudflats

General Description: These are areas along the coast that are intermittently under marine water depending on tidal conditions. In coastal embayment's they are found just below the lower marsh zone in tidal basins, channels, and creeks where vascular plants cannot survive. The fine grained, soft bottom substrate supports a variety of algal species as well as eelgrass beds at the lowest reaches.

Characteristic Algal and Plant Species: *Ulva lactuca* (sea lettuce), *Ulva intestinalis* (*Enteromorpha*), *Ruppia maritima* (widgeon grass), and *Zostera marina* (common eelgrass).

Site Specific Distribution: Intertidal mudflats are present in fully tidal areas of Steamshovel Slough. These mudflats have not been surveyed for biota, but appear to be rich in biological diversity both when exposed and covered by the tides.



Ecological Services: Healthy mudflats, like those at Steamshovel Slough, support a wide variety of marine invertebrates (e.g. bivalves, gastropods, annelids, and crustaceans) that are integral to the coastal salt marsh ecosystem. At low tides, mudflats offer a critical foraging habitat for migratory species of sandpipers and other probing bird species. When flooded these flats become a foraging source for marine fish species such as *Paralichthys californicus* (California halibut), *Hypsosetta guttulata* (diamond turbot), and various elasmobranchs, while providing burrowing habitat for a variety of benthic marine fish species.

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2.2 Wetland Habitat Types

Unaltered coastal wetlands are composed of a mosaic of plant communities. These components reflect variations in elevation, salinity, soil moisture and hydrology. The resources and functions of a coastal wetlands ecosystem like Los Cerritos Wetlands is a culmination of resources and functions provided by these habitat types listed below.

2.2.1 Southern Coastal Salt Marsh

General Description: This plant community is found within a 2 to 3 meter intertidal elevation range along sheltered inland margins of bays, lagoons, and estuaries subject to regular inundation by sea water. It is dominated by highly productive, herbaceous and suffrutescent, salt tolerant hydrophytes forming moderate to dense cover up to one meter tall. The plant species are usually segregated by elevation with *Spartina foliosa* (Pacific cordgrass) dominating the low marsh, *Sarcocornia pacifica* (common pickleweed) in middle marsh, and *Arthrocnemum subterminale* (Parish's glasswort) in the upper marsh. Unvegetated intertidal areas, known as salt pannes, often form in the upper marsh where soil salinities may reach as high as 200 ppt.



Photo 8: Southern Coastal Salt Marsh at Steamshovel Slough

Characteristic Plant Species:

Lower marsh - *S. foliosa*;

Mid-marsh - *S. pacifica*, *Salicornia bigelovii* (annual pickleweed), *Limonium californicum* (sea-lavender), *Jaumea carnosa* (salty susan), *Triglochin concinna* (arrow-grass), *Batis maritima* (saltwort), *Suaeda esteroa* (estuary sea-blite), *Cuscuta salina* (salt marsh dodder);

Upper Marsh - *A. subterminale*, *Frankenia salina* (alkali heath), *Distichlis spicata* (salt grass), *Atriplex watsonii* (salt scale), *Lycium californicum* (California boxthorn), *Monanthochloe littoralis* (shore grass).

Site Specific Distribution: As recently as 1873 nearly 90% of the study area was once intertidal salt marsh vegetation (**Table 1**; Stein et al., 2007; Grossinger et al., 2011). While much of the habitat within Los Cerritos Wetlands can be considered coastal salt marsh, due to the presence of representative plant species, only three locations (at Zedler Marsh, Steamshovel Slough and the Hellman Lowlands) support tidal salt marsh. Steamshovel Slough supports the best example of this plant community. While it also exists at LCWA Phase 1 and 2 properties these areas of tidal salt marsh are relatively degraded due to limited tidal exchange. Zedler Marsh and the Hellman Lowlands support middle marsh habitats bordered by heavily degraded upper marsh and no lower marsh.

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Two salt marsh plant species, *S. pacifica* and *D. spicata* are widespread in the complex, occurring in nearly every wetlands habitat type. The presence of either of these species alone were not enough to indicate salt marsh habitat (or even wetland habitat in some instances), but were probably indicative of salty soils.

Salt marsh habitats resembling the upper marsh plant community are present in non-tidal areas and were identified by the presence of at least two salt marsh species in addition to *S. pacifica* and *D. spicata*. In these cases, recognizable zonation of the salt marsh is no longer present due to the absence of tidal influence. These areas also experience periods where they are diluted by pooling freshwater and are increasingly being encroached upon by brackish marsh plant species. The lower marsh plant community is not well established within the wetland complex and can only be found at Steamshovel Slough. Several plugs of *S. foliosa* were planted in Zedler Marsh in Spring 2011, but these patches are hardly noticeable.

Ecological Services: This is one of the most biologically productive habitat types on the Pacific coast (Zedler, 1984). Coastal salt marshes provide feeding grounds and rest stops for migratory birds as well as nursery grounds for marine fisheries. The suitability of existing salt marsh habitat for nesting by the Endangered Light-footed Clapper Rail (*Rallus longirostris levipes*) or the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) is discussed below in the special status species report.

2.2.2 Salt Flats

General Description: This habitat type is found in shallow depressions with high water tables. The total vegetation cover and species richness is usually low (<30%) as a result of harsh soil conditions. Salt flat soils are fine-grained and impervious. At LCW these areas may coincide with disturbance that has led to the loss of vegetation coverage. They are often permanently hypersaline and may have shrink/swell cracking at the surface. Salt crusts may accumulate on the soil surface when dry. At LCW, these areas are probably derived from a variety of degraded salt marsh habitats. At LCW, some of these areas may become brackish and support submerged algae. Many areas currently supporting this habitat at LCW lack the defining salt panne plant species *Batis maritima* (salt wort) and *Monanthochloe littoralis* (shore grass).



Photo 9: Salt Flats pooling with rainwater

This habitat is also commonly referred to as alkali flats, alkali playas, or alkali seeps and differs from salt pannes (a sub-habitat type of salt marshes) by the fact that they are non-tidal ephemeral wetlands. The plant community that most closely resembles this habitat type is alkali playa which is commonly found in desert regions, however, the *Cressa truxillensis* - *Distichlis spicata* (Alkali weed - Salt grass playas and sinks) Alliance (Holland global and state rank G4 S4

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CNNDB code 46.100.00) is found in Los Cerritos. Vegetation however is sparse much of the year due to alkali weed's annual life history.

Characteristic Plant Species: *Ruppia maritima* (widgeon-grass), *Cressa truxillensis* (alkali weed), *S. pacifica* (common pickleweed), and *D. spicata* (salt grass).

Site Specific Distribution: Salt flats at Los Cerritos Wetlands typically flood during the rainy season. Currently, this habitat type generally occurs throughout the Bixby Ranch Wetlands, Hellman Lowlands and LCWA Phase 1 and 2 properties in low elevation fill areas with high salt content.

Ecological Services: The flooded conditions are hot spots for wintering migratory bird species and amphibians like the Baja California treefrog, but once dry the flats become inhospitable to most wetlands organisms.

2.2.3 Southern Willow Scrub

General Description: This plant community is defined by dense, broad-leaved, winter deciduous riparian thickets dominated by willows (*Salix* spp.). Dense stands have little much understory development. Soils are perennially moist or supported by a high freshwater table.

Characteristic Plant Species: *Salix gooddingii* (black willow), *Salix lasiolepis* (arroyo willow), *Pluchea odorata* (salt marsh fleabane), and *Baccharis salicifolia* (mule fat)



Photo 10: Southern Willow Scrub at Marketplace Marsh

Site Specific Distribution: This habitat was once extensive along the southern California river systems, but has been much reduced due to impacts from urbanization and alteration of stream channels and floodplains. This habitat type probably did not exist historically within this project area (Stein et al., 2007). Currently, freshwater influence along the boundaries of Marketplace Marsh and the Bixby Ranch Wetlands support stands of willows. These areas are dominated by *S. lasiolepis*, *S. gooddingii*, *B. salicifolia*, and the exotic invasives *Myoporum laetum* (ngaio tree), *Tamarisk* sp. (salt cedar), and *Washingtonia robustus* (Mexican fan palms).

Ecological Services: Having the most vertical stratification, this plant community has the potential to host the greatest diversity of bird species including nesting and foraging habitat. Habitat for amphibians is also provided.

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2.2.4 Mulefat Scrub

General Description: This plant community is a depauperate, tall, herbaceous riparian scrub strongly dominated by *Baccharis salicifolia*. In riparian settings it is an early seral community maintained by frequent flooding that keeps it from succeeding to cottonwood- or sycamore-dominated woodlands.

Characteristic Plant Species: *B. salicifolia*, *Baccharis* spp., *Carex* spp., and *Salix* spp.

Site Specific Distribution: Historically this wetlands plant community was not as widespread as it currently is within the project area (Tables 1&3; Grossinger et al., 2011). Currently, mulefat scrub is more dominant and extensive than southern willow scrub in Los Cerritos Wetlands and is found dispersed throughout the complex. It is located in non-tidal areas where freshwater inputs are strong and long-term freshwater pooling occurs. Mulefat, *B. salicifolia*, is the dominant plant species, but is accompanied often by *B. emoryi*, *B. pilularis*, and *Isocoma menziesii* (golden bush), as well as the non-native *Myoporum laetum*. Understory vegetation is usually composed of *D. spicata*, non-native weedy species, or is lacking altogether.

Ecological Services: Like southern willow scrub this habitat's vertical stratification provides excellent bird habitat. Populations of the salt marsh wandering skipper are frequently documented in understories composed of *D. spicata*.

2.2.5 Alkali Meadow

General Description: This plant community is composed of dense to fairly open growth of perennial grasses and sedges. It is usually low growing with occasional tufts up to one meter high. The meadows may intergrade with southern coastal salt marsh and southern coastal brackish marsh. Soils are fine textured, alkaline and intermittently flooded from winter rainfall.

Characteristic Plant Species: *Schoenoplectus maritimus* (salt marsh bulrush), *Anemopsis californica* (yerba mansa), *Eleocharis macrostachya* (spike rush), *Leymus triticoides* (alkali rye), *Sarcocornia pacifica* (pickleweed), *Distichlis spicata* (salt grass), and *Juncus acutus leopoldii* (southwestern spiny rush). Often the community is invaded by the non-native species *Polypogon monspeliensis* (rabbit's foot grass) and *Rumex crispus* (curly dock).

Site Specific Distribution: Historically this habitat type once covered over 23,000 acres of land in the San Gabriel River floodplain (Stein et. al. 2007). They have been inadvertently recreated in Los Cerritos Wetlands as a result of



Photo 11: Mulefat Scrub after a rain event



Photo 12: Alkali Meadow on LCWA phase 1 property

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former tidal salt marsh being artificially filled above sea level by fine textured saline soils. These meadows generally occur in basins formed by roadways throughout the LCWA Phase 1 Properties, the Bixby Ranch Wetlands, and Marketplace Marsh. These meadows are also found along the fringes of salt flats and are relatively low in species richness at Los Cerritos due to the manner by which this habitat type has been formed.

Ecological Services: This plant community provides breeding habitat for amphibians and foraging habitat for migrating shorebirds and ducks. These meadows provide important coastal grassland foraging habitat for raptor species (namely red-tail hawks, American kestrels, and white-tailed kites).

2.2.6 Southern Coastal Brackish Marsh

General Description: This plant community is dominated by perennial, emergent, herbaceous monocots that grow up to two meters tall. Cover is often complete and dense, and similar to salt marshes and to freshwater marshes with some plant species characteristic of each. They are usually found at the interior edges of coastal bays and estuaries or in coastal lagoons where freshwater influence is measurable.

Characteristic Plant Species: *Carex* spp. (sedges), *Distichlis spicata* (salt grass), *Sarcocornia pacifica* (common pickleweed), *Schoenoplectus* spp. (bulrushes), and *Typha* spp. (cattails).

Site Specific Description: The historical presence of this wetlands plant community is not clearly documented. Currently, one large area of southern coastal brackish marsh exists at Marketplace Marsh along with several other smaller locations found on the LCWA Phase 1 western parcel and the Bixby Ranch Wetlands. The presence of this plant community at Los Cerritos Wetlands is dependent on freshwater runoff from surrounding urban areas and oil operations. It is most often found in oil field drainage ditches along roadsides, adjacent to street curb-cuts, and within deeper basins fed by culverts from urban areas.

Ecological Services: This habitat type offers foraging and breeding habitat for passerines, finches, wrens, and other small birds, as well as habitat for the American bittern and other members of the Aradeidae family. The long-standing water conditions offer dabbling habitat for migratory ducks and foraging for shorebirds. The aquatic setting provides habitat for amphibians as well as non-native crawfish.



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2.2.7 Ruderal Wetlands

General Description: These areas have potential to be considered as jurisdictional wetlands based on observed vegetation, hydrology, and/or soil conditions, but are composed of more than 75% non-native vegetation mixed with less than two native plant species. These wetlands are sometimes entirely bare of vegetation.

Characteristic Plant Species: *Bassia hyssopifolia* (five-hook *Bassia*), *Polypogon monspeliensis* (rabbits foot grass), *Brassica nigra* (black mustard), *Mesembryanthemum nodiflorum* (slender-leaved iceplant), *Centromadia parryi australis* (southern tarplant), *Baccharis salicifolia* (mulefat), *Distichlis spicata* (salt grass), and *Sarcocornia pacifica* (common pickleweed).

Site Specific Distribution: This habitat type is found dispersed throughout the entire wetland complex. It is most common in areas that are impacted more by industrial land uses and along the edges of roadways. These areas could be transformed into alkali meadows, coastal brackish marshes, coastal salt marshes, or mulefat scrub habitats by reducing disturbances and controlling the non-native species.

Ecological Services: Southern tarplant (*C. parryi ssp. australis*) often colonizes these areas and mixes with the non-native species. The existence of salt grass provides habitat for the salt marsh wandering skipper. However, these services are limited.



Photo 14: Ruderal wetlands
at LCWA Phase 1

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2.3 Upland Habitat Types

In southern California, unaltered coastal wetlands intergrade with several upland plant communities. Differences in plant communities reflect variations in substrate, elevation, salinity, freshwater exposure, hydrology, and disturbance. The resources and function of a coastal wetlands ecosystem like Los Cerritos Wetlands is a culmination of resources and functions provided by these upland habitat types. However, at Los Cerritos Wetlands only ruderal upland habitats are present.

2.3.1 Ruderal Uplands

General Description: Areas defined as ruderal uplands do not possess the characteristics needed to be potentially considered as jurisdictional wetlands and are composed of more than 75% non-native vegetation mixed with less than two native plant species. Depending on soil quality or land uses these upland areas are bare or entirely infested by non-native vegetation.

Characteristic Plant Species: *Bassia hyssopifolia* (five-hook *Bassia*), *Polypogon monspeliensis* (rabbits foot grass), *Brassica nigra* (black mustard) *Mesembryanthemum nodiflorum* (slender-leaved iceplant), *Carpobrotus edulis* (Hottentot-fig), *Centromadia parryi australis* (southern tarplant), *Baccharis salicifolia* (mulefat), *Centaurea melitensis* (tocalote), *Hirschfeldia incana* (short-pod mustard), *Conyza canadensis* (Canadian horseweed), *Myoporum laetum* (Ngaio tree), and *Isocoma menziesii* (goldenbush).

Site Specific Distribution: Historically within the project area, uplands existed along the southeast edge of the Hellman Lowlands as part of a coastal bluff system. The historical extent of Alamitos Bay was bordered by sage scrub, coastal strand and southern coastal bluff scrub upland plant communities; all of which have been lost, leaving no native upland plant communities intact within the project area. Ruderal uplands are currently the most widely spread habitat type at Los Cerritos Wetlands, comprising 21.8% of the study area (**Table 3**). Most existing supratidal areas are located on historic coastal salt marsh habitat (**Figure 4a&b**). The previous wetlands were converted to uplands by the introduction of fill that raised the elevation above sea level and subsequently have become infested by weedy species or remain bare due to poor soil quality.

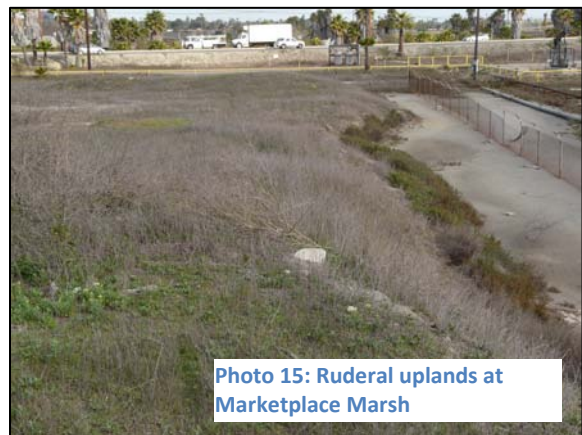


Photo 15: Ruderal uplands at Marketplace Marsh

Ecological Services: The services provided are considerably less than what could be provided by native upland plant communities. However, upland animals such as Audubon cottontail rabbits (*Sylvilagus audubonii*), California ground squirrels (*Otospermophilus beecheyi*), coyotes (*Canis latrans*), raptors, and reptiles utilize these areas around the edges of the wetlands for foraging and shelter. Burrowing owls (*Athene cunicularia*) also utilize scarcely vegetated areas that contain mammal burrows. Upland areas in Los Cerritos Wetlands have also been documented to provide foraging habitat for raptors.

3.0 SPECIAL STATUS SPECIES REPORT

The Los Cerritos Wetlands Complex is not well known for supporting large populations of sensitive species. This is understandable considering the system's fragmented condition and isolation from tidal exchange combined with various degrees of historic degradation have likely resulted in the local extirpation of many sensitive species typically associated with southern California's coastal wetlands.

Few studies at LCW have documented special status species. Moreover, privately commissioned studies made claim that special status species were absent from areas where they currently are present, notably the California least tern and Belding's savannah sparrow, as well as Coulter's goldfields (Natural Resource Consultants, 1995; Michael Brandman Associates, 1996).

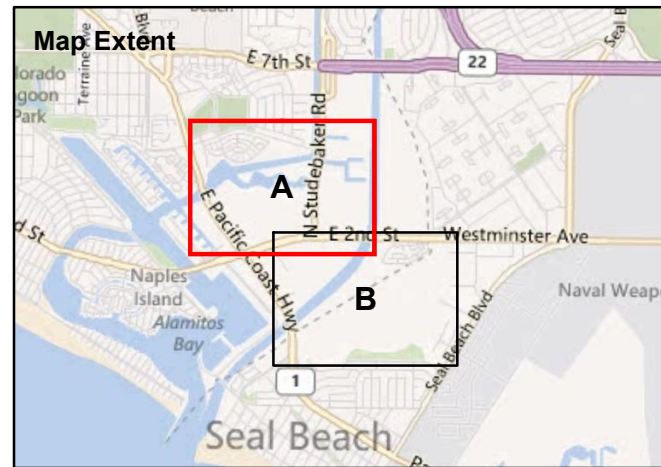
3.1 Methods

Tidal Influence biologists have been conducting unofficial surveys for special status species on public land within the Los Cerritos Wetlands Complex since 2006. So while field work for this study occurred outside of the appropriate season for detecting many species of concern (**Table 2** for dates of assessment), past knowledge of the site was used to fill any geographic data gaps. While the maps of species population ranges and locations are important, the simple presence or absence of special status species are critical data for determining the restoration design alternatives.

Special status species surveys were not conducted on private land holdings, however, in some instances historical data from past reports were used to determine the potential for certain rare species to exist on private land.

To identify sensitive species known or potentially occurring within the Los Cerritos Wetlands Complex, multiple data sources were investigated to augment field surveys. In particular, sensitive species were identified regionally through queries of the California Natural Diversity Data Base (CNDDDB, 2012). The CNDDDB record search was conducted the Los Alamitos and Seal Beach Quadrangles that captured records for not only the Los Cerritos Wetlands, but also the natural areas of El Dorado Nature Center, Colorado Lagoon, Anaheim Bay, and Bolsa Chica Wetlands. After conducting the CNDDDB record search, the list of identified species and recorded occurrences for the region were compiled. To augment CNDDDB records, various survey documents addressing specific areas of the Wetlands Complex were reviewed and a list of species potentially occurring within the existing habitats at Los Cerritos Wetlands was prepared (**Table 4a&b**).

Special status species maps for both the flora (**Figure 6a&b**) and the fauna (**Figure 7a&b**) were prepared as part of this study.



- Map Extent**
- Study Site Boundary**
- Special Status Plant Species**
- California Boxthorn (*Lycium californicum*)
 - ▲ Woolly Sea-blite (*Suaeda taxifolia*)
 - Coulter's Gold Fields (*Lasthenia glabrata* ssp. *coulteri*)
 - Estuary Sea-blite (*Suaeda esteroa*)
 - Lewis' Primrose (*Camissonia lewisii*)
 - Southern Tarplant (*Centromadia parryi* ssp. *australis*)
 - Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)



Potential Special Status Plant Habitat

View A

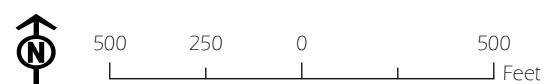
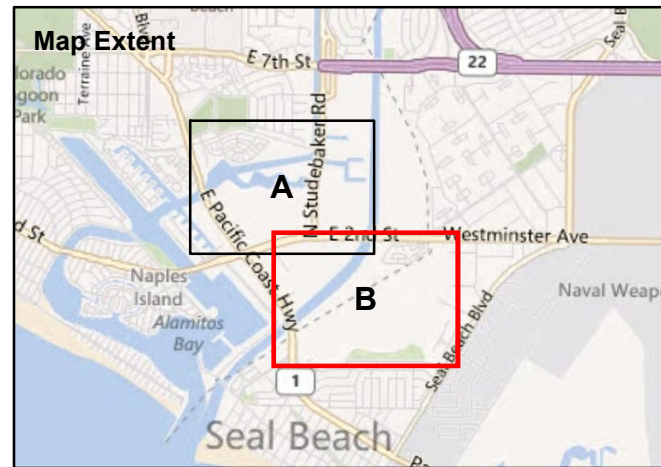
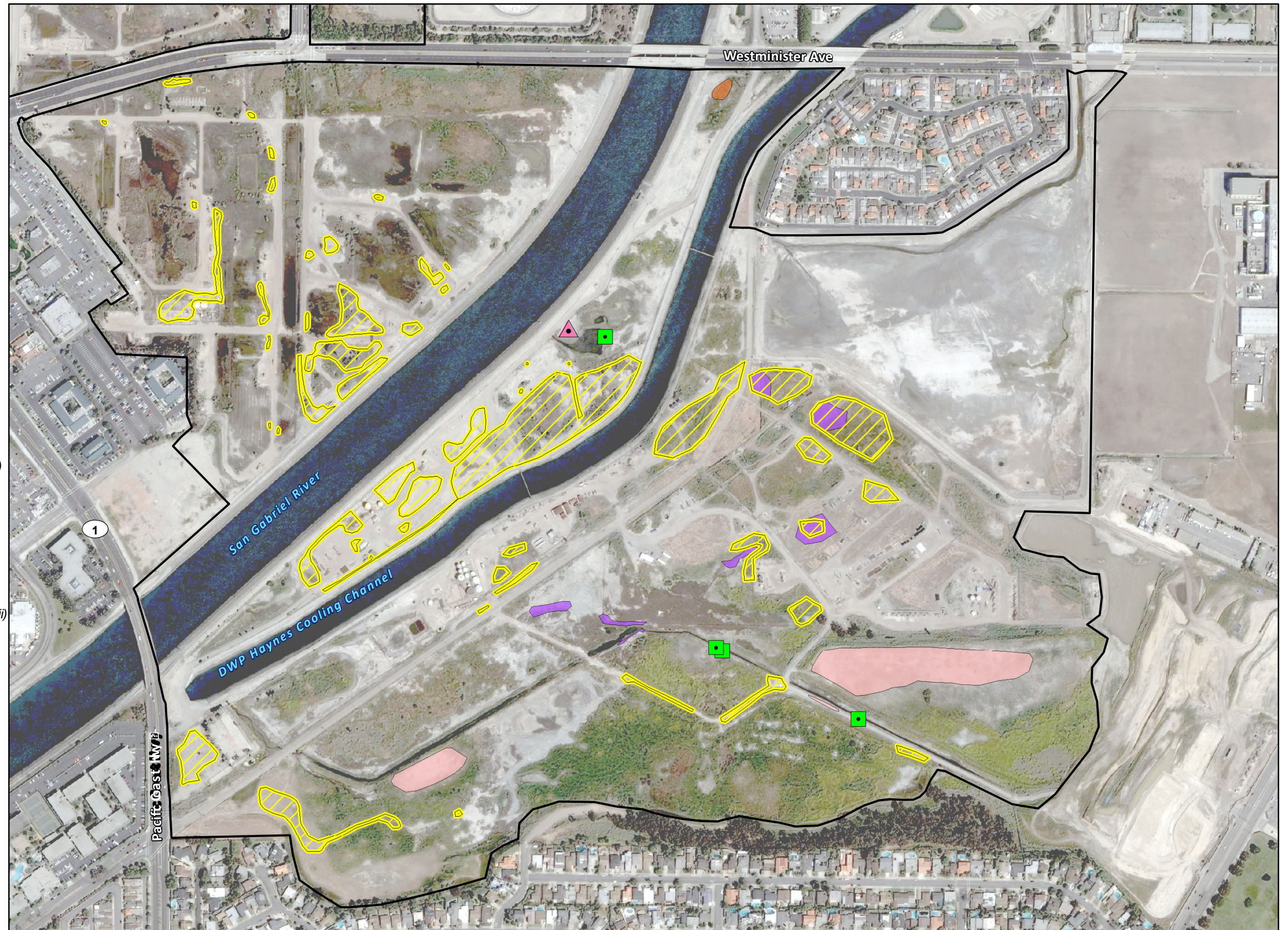


Figure 6a: Special status plant species present within study site north of 2nd street



- Study Site Boundary
- Special Status Plant Species**
- California Boxthorn (*Lycium californicum*)
 - Woolly Sea-blite (*Suaeda taxifolia*)
 - Coulter's Gold Fields (*Lasthenia glabrata* ssp. *coulteri*)
 - Estuary Sea-blite (*Suaeda esteroa*)
 - Lewis' Primrose (*Camissonia lewisii*)
 - Southern Tarplant (*Centromadia parryi* ssp. *australis*)
 - Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)



Potential Special Status Plant Habitat

View B

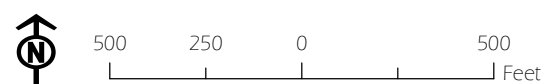
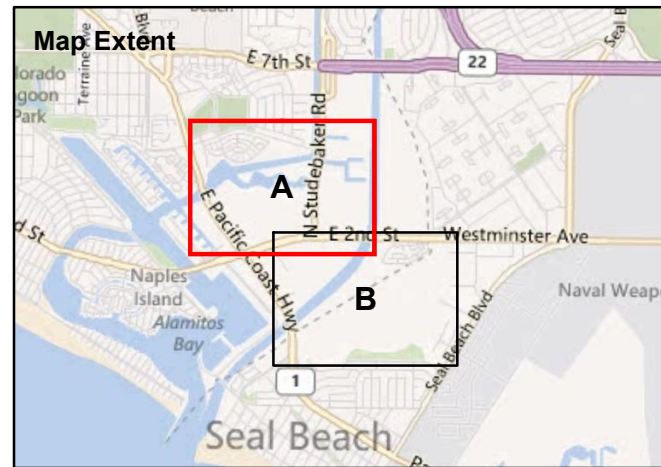
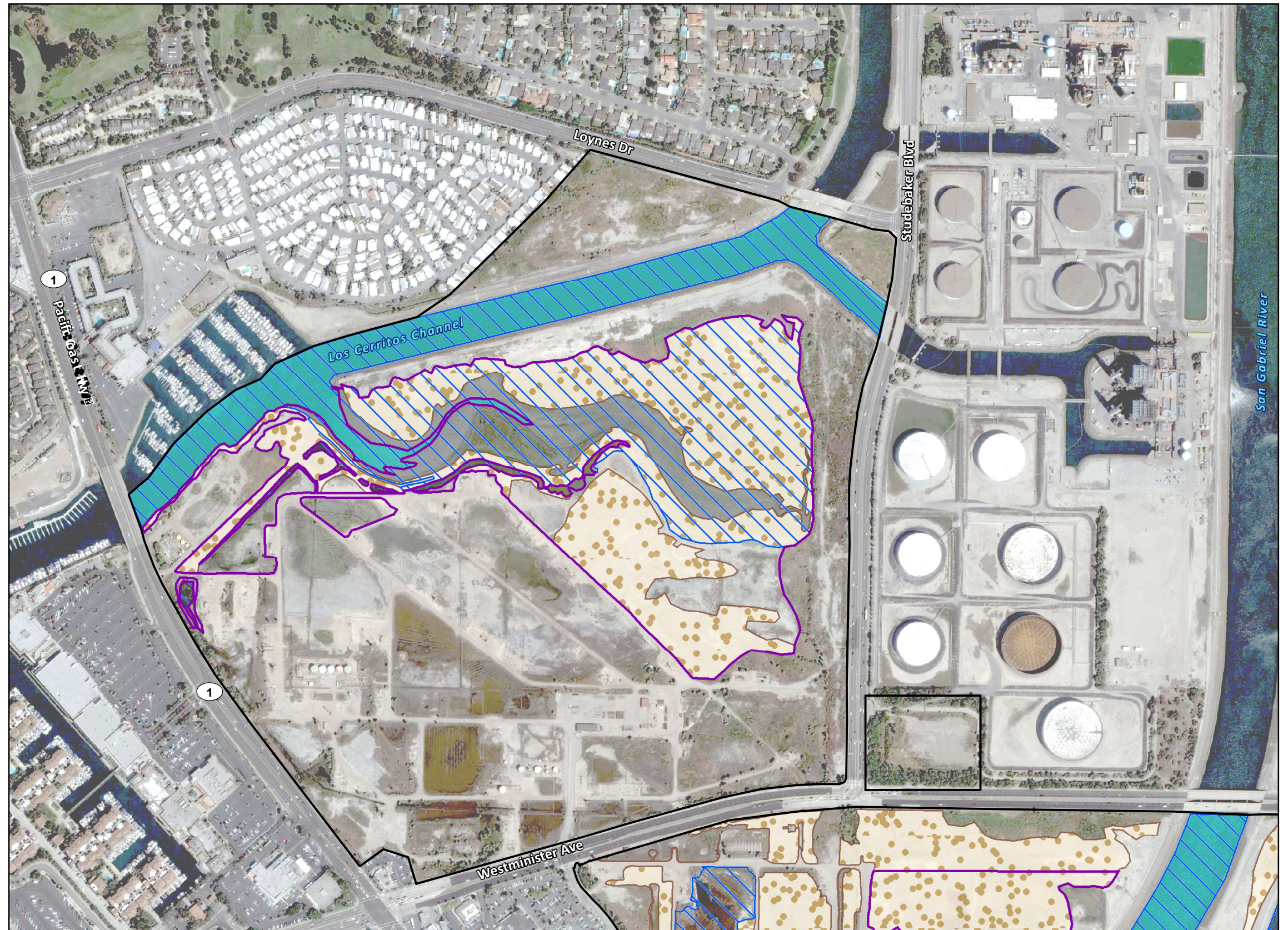


Figure 6b: Special status plant species south of 2nd street



- Study Site Boundary
- Special Status Animal Species**
- Beldings Savannah Sparrow Habitat
 - Burrowing Owl Habitat
 - California Least Tern Habitat
 - Pacific Green Sea Turtle Habitat
 - Salt Marsh Wandering Skipper Habitat



Potential Special Status Animal Habitat

View A

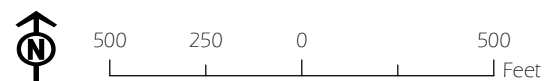
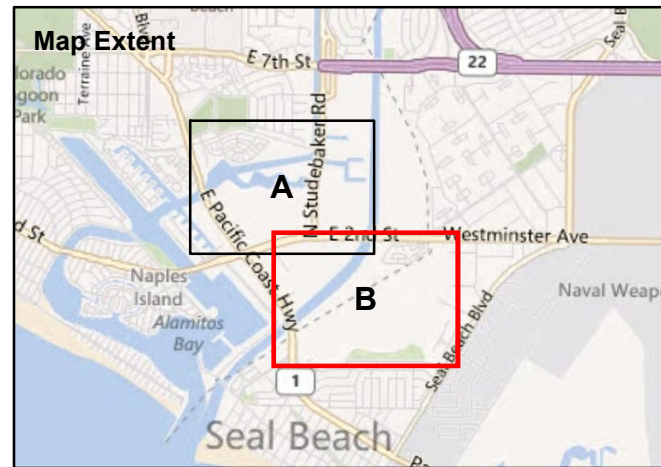
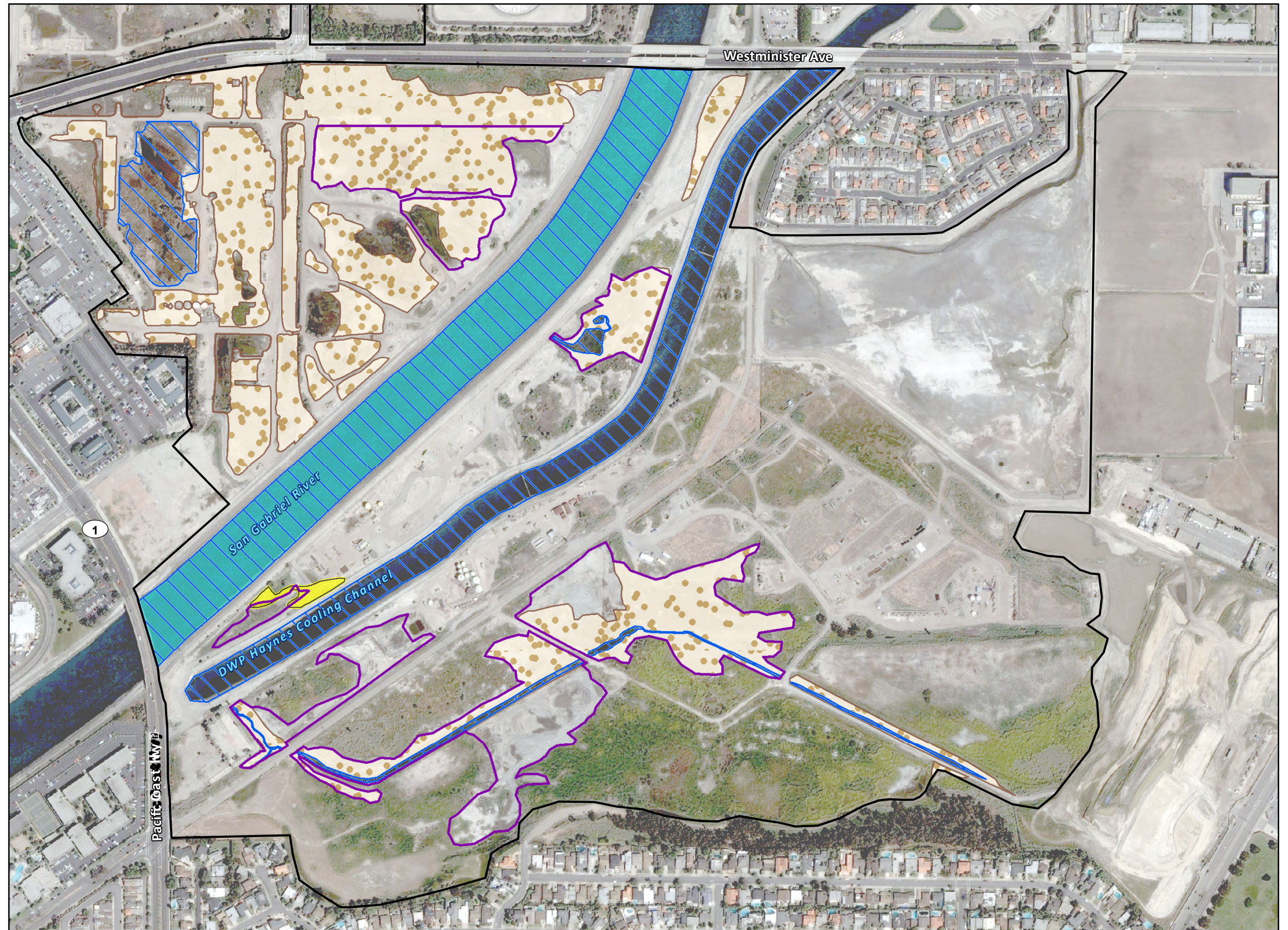


Figure 7a: Special status animal species within the study site north of 2nd street



- Study Site Boundary
- Special Status Animal Species**
- Beldings Savannah Sparrow Habitat
 - Burrowing Owl Habitat
 - California Least Tern Habitat
 - Pacific Green Sea Turtle Habitat
 - Salt Marsh Wandering Skipper Habitat



Potential Special Status Animal Habitat

View B

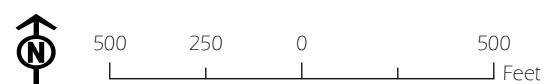


Figure 7b: Special status animal species within the study site south of 2nd street

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Table 4a. Special status plant species known from the vicinity with potential to occur in Los Cerritos Wetlands*

Scientific Name	Common Name
<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>	Ventura Marsh Milk-vetch
<i>Atriplex coulteri</i>	Coulter's Saltbush
<i>Atriplex parishii</i>	Parish's Brittnescale
<i>Atriplex serenana</i> var. <i>davidsonii</i>	Davidson's saltscale
<i>Calystegia sepium</i> ssp. <i>binghamiae</i>	Santa Barbara Morning-glory
<i>Camissonia lewisii</i>	Lewis' Evening Primrose
<i>Centromadia parryi</i> ssp. <i>australis</i>	Southern Tarplant
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	Salt Marsh Birds Beak
<i>Juncus acutus</i> ssp. <i>leopoldii</i>	Southwestern Spiny Rush
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's Goldfields
<i>Lycium californicum</i>	California Boxthorn
<i>Nama stenocarpum</i>	Mud Nama
<i>Nasturtium gambelii</i>	Gambel's Watercress
<i>Nemacaulis denudata</i> var. <i>denudata</i>	Coast Woolly Heads
<i>Orcuttia californica</i>	California Orcutt grass
<i>Sagittaria sanfordii</i>	Sanford's arrowhead
<i>Sidalcea neomexicana</i>	Salt Spring Checkerbloom
<i>Suaeda esteroa</i>	Estuary Sea-Blite
<i>Suaeda taxifolia</i>	Woolly Sea-Blite
<i>Symphotrichum defoliatum</i>	San Bernardino Aster

*Data compiled from CNNDDB, 2012 for Seal Beach and Los Alamitos quadrangle



Photo 16: Coulter's Goldfields



Photo 17: Southern Tarplant



Photo 18: Southwestern Spiny Rush



Photo 19: Woolly Sea-Blite

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Table 4b. Special status animal species known from the vicinity with potential to occur in Los Cerritos Wetlands*

Scientific Name	Common Name
<i>Agelaius tricolor</i>	Tricolored Blackbird
<i>Asio flammeus</i>	Short-eared Owl
<i>Athene cunicularia</i>	Burrowing Owl
<i>Charadrius alexandrinus nivosus</i>	Western Snowy Plover
<i>Chelonia mydas</i>	Pacific Green Sea Turtle
<i>Cicindella trifasciata sigmoides</i>	Salt Marsh Tiger Beetles
<i>Circus cyaneus</i>	Northern Harrier
<i>Coccyzus americanus occidentalis</i>	W. Yellow-billed Cuckoo
<i>Empidonox trailii extimus</i>	Southwestern Willow Flycatcher
<i>Emys marmorata</i>	Western Pond Turtle
<i>Eucyclobobius newberryi</i>	Tidewater Goby
<i>Eumops perotis californicus</i>	Western Mastiff Bat
<i>Icteria virens</i>	Yellow-Breasted Chat
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Lasiurus xanthinus</i>	Western Yellow Bat
<i>Microtus californicus stephensi</i>	South Coast Marsh Vole
<i>Panoquina errans</i>	Salt Marsh Wandering Skipper
<i>Passerculus sandwichensis beldingi</i>	Belding's Savannah Sparrow
<i>Perognathus longimembris pacificus</i>	Pacific Pocket Mouse
<i>Phrynosoma blainvillii</i>	Coast Horned Lizard
<i>Poliophtila californica californica</i>	Coastal California Gnatcatcher
<i>Rallus longirostris levipes</i>	Light-footed Clapper Rail
<i>Rynchops niger</i>	Black Skimmer
<i>Sorex ornatus salicornicus</i>	Southern California Saltmarsh Shrew
<i>Sterna antillarum browni</i>	California Least Tern
<i>Vireo bellii pusillus</i>	Least Bell's Vireo

*Data compiled from CNNDDB, 2012 for Seal Beach and Los Alamitos quadrangle

Photo 20: Belding's Savannah Sparrow



Photo 21: Least Tern adult and juvenile



Photo 22: Pacific Green Sea Turtle

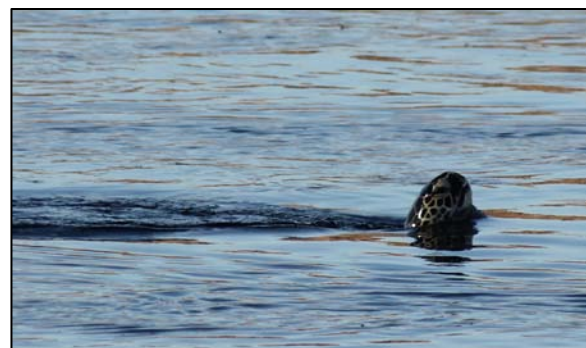


Photo 23: Salt Marsh Tiger Beetles



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The on-site status of all of the species identified within **Table 4a&b** has not been fully investigated for the entire Complex under the present study or in prior studies. However, many species with potential to occur in the system are strongly associated with habitat types that have been identified occurring at Los Cerritos Wetlands. Therefore, it is possible to gain a relatively good understanding of the potential for occurrence and the likelihood for a special status species resource to go undocumented within the Complex. Each of the 46 special status species listed above were analyzed to identify their potential to occur on-site in the Los Cerritos Wetlands Complex. The results of this analysis are summarized in **Table 5a&b**.

3.2 Special Status Plant Species

Special status plant species include all federal- and state-listed endangered and/or threatened species and those that have been identified by the California Native Plant Society (CNPS) as having a limited distribution in California and throughout their range.

The CNDDDB literature review resulted in a list of 20 sensitive plant species that have records of occurrence on or within the same quads as the project site. Four of the 20 special status plant species, salt marsh bird's-beak, Ventura River milk-vetch, Gambel's watercress, and California Orcutt grass, are federal- and/or state-listed as endangered, threatened, or candidate species. However, none of these species were documented on site during visits or were previously documented in the Los Cerritos Wetlands Complex. The most widespread sensitive plant species is by far the southern tarplant. This species thrives in disturbed conditions like those found throughout LCW. Populations of Coulter's goldfields appear to be the most precarious as they are only located in Seal Beach and their locations are not consistent from year to year (Glenn Lukos Associates, 2010).

3.3 Special Status Animal Species

Special status animal species include all those federal- and state-listed endangered and/or threatened species and those that have been identified as Species of Special Concern by CDFG.

The CNDDDB literature review resulted in a list of 26 sensitive animal species that have records of occurrence on or within the same quads as the project site and were reasonable to be analyzed for their potential to occur. A total of eleven animals that are federal- or state-listed have a potential to occur on the site. Of these only the Belding's savannah sparrow, California least tern, and Pacific green sea turtle have been documented to be present within the study area.

Belding's savannah sparrow is the most prevalent of this listed species within the study area. This resident bird species has been observed nesting in salt marsh vegetation throughout the LCW Complex. Regular statewide counts by Dick Zembal have found populations as high as 33 breeding pairs at Steamshovel Slough (**Figure 8**; Zembal and Hoffman, 2010).



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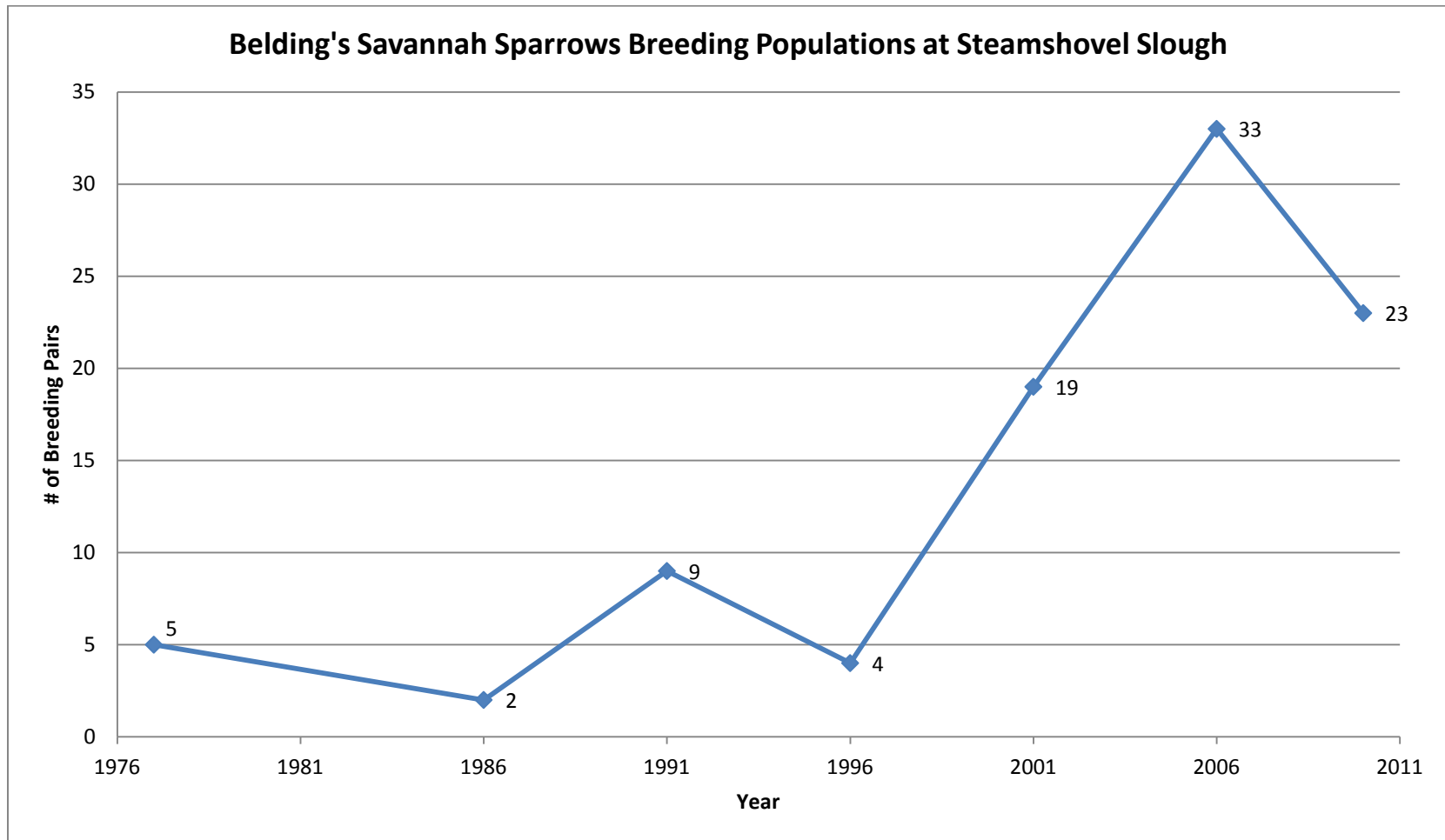


Figure 8. Belding's Savannah Sparrow population trends at Steamshovel Slough in Los Cerritos Wetlands (data from Zembal and Hoffman 2010).

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The California least tern is a seasonal visitor to LCW and does not appear to be nesting currently within the study area, which makes it of less concern than the Belding's savannah sparrow. However, the Pacific green sea turtle appears to be present year-round in the San Gabriel River. Unfortunately, very little is known about this species' population size and site fidelity.



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Each special status species was categorized based on the following criteria:

Present: Species was observed on the project site at the time of the surveys.

High: Both a historical record exists of the species within the project site or its immediate vicinity (approximately 5 miles) and the habitat requirements associated with the species occur on the project site;

Moderate: Either a historical record exists for the species within the immediate vicinity of the project site (approximately 5 miles) or the habitat requirements associated with the species occur on the project site;

Low: No records exist of the species occurring within the project site or its immediate vicinity and/or habitats needed to support the species are of poor quality or absent; and

Absent: This category was not used because of limited access and seasonal constraints of the study.

In addition to the above-listed criteria, potential for occurrence is also based on levels of disturbance to a site, proximity to existing developments, age of historical records, and the amount of development and disturbance that has occurred during the time subsequent to the latest record.

Table 5a. Status of known and potentially occurring special status animal species in Los Cerritos Wetlands.*

Special Status Species	Status	Habitat	Potential to Occur On-Site
Flora			
California Boxthorn (<i>Lycium californicum</i>)	CNPS list 3 Fed: None State: None	Succulent shrub. Occurs along coastal salt marsh margins, coastal sage scrub and coastal bluffs up to 500 feet in elevation.	Present: Three individuals of this species exist naturally along the tidal creek that traverses the LCWA Phase 2 Parcel. Individuals are currently being planted at Zedler Marsh.
Coulter's Goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>)	CNPS list 4 Fed: None State: None	Annual herb. Occurs in coastal salt marshes, alkali playas, and vernal pools up to 3000 feet in elevation.	Present: Several populations of this species were identified in spring 2011 by Tidal Influence botanists on the LCWA Phase 2 property. Several populations were also identified on the Hellman Retained Property in 2009 and 2010 by Glen Lukos

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Estuary Sea-Blite (<i>Suaeda esteroa</i>)	CNPS list 1B.1 Fed: None State: None	Perennial herb. Occurs in coastal salt marshes and swamps up to 15 feet in elevation.	Present: This species is found extensively within the middle and upper salt marsh zones at Steamshovel Slough. It is absent from all other areas probably as a result of considerable degradation of the tidal prism. As part of the LCWA's Stewardship Program individuals are currently being planted at Zedler Marsh.
Lewis' Evening Primrose (<i>Camissonia lewisii</i>)	CNPS list 1B.1 Fed: None State: None	Annual herb. Occurs in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland in sandy or clay soil up to 985 feet in elevation.	Present: This species is well established in two sandy fill areas on the LCWA Phase 2 parcel.
Southern Tarplant (<i>Centromadia parryi</i> ssp. <i>australis</i>)	CNPS list 1B.1 Fed: None State: None	Annual herb. Occurs in disturbed areas near coastal salt marshes, grasslands, vernal pools and coastal sage scrub up to 1400 feet in elevation.	Present: This species is found within disturbed upland and wetland habitats throughout LCW and is relatively abundant within the project area. A particularly dense occurrence of this species is found in the exclusive easement for SHPI's oil operation on the LCWA Phase 1 property.
Southwestern Spiny Rush (<i>Juncus acutus</i> ssp. <i>leopoldii</i>)	CNPS list 4.2 Fed: None State: None	Perennial herb. Occurs in coastal salt marshes, alkali seeps, and coastal strand habitats up to 1000 feet in elevation.	Present: One small population of this species is found naturally occurring on the Bryant Retained Parcel located on the Isthmus. As part of the LCWA's Stewardship Program individuals are currently being planted at Zedler Marsh.

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Woolly Sea-Blite (<i>Suaeda taxifolia</i>)	CNPS list 1B.2 Fed: None State: None	Succulent shrub. Occurs along coastal salt marsh margins and coastal bluffs up to 45 feet in elevation.	Present: This species occurs at two locations at Steamshovel Slough. As part of the LCWA's Stewardship Program individuals are currently being planted at Zedler Marsh.
Mud Nama (<i>Nama stenocarpum</i>)	CNPS list 1B.1 Fed: None State: None	Perennial herb. Occurs in freshwater wetlands up to 300 feet in elevation.	Moderate: This species has the potential to occur within the study area due to conditions present at several freshwater wetlands areas throughout the complex.
Salt Marsh Birds Beak (<i>Chloropyron maritimum ssp. maritimum</i>)	CNPS list 1B.2 Fed: Endangered State: Endangered	Annual herb. Occurs in coastal salt marshes and coastal dunes up to 33 feet in elevation.	Moderate: This species has potential to occur within the study area due to conditions present at Steamshovel Slough. However, because of the species' high sensitivity and distinct appearance, it is unlikely that this species would occur at any substantial levels without historic detection.
Coast Woolly Heads (<i>Nemacaulis denudata var. denudata</i>)	CNPS list 4.2 Fed: None State: None	Annual herb. Occurs in coastal dunes in sandy soils up to 330 feet in elevation.	Low: This coastal dune species has a low potential to occur in the sandy fill areas on the LCWA Phase 2 property. This species is not expected to occur due to the lack of suitable habitat and the high degree of disturbance, and the general lack of potential for the species to recruit to the site from nearby source populations.
California Orcutt grass (<i>Orcuttia californica</i>)	CNPS list 2.2 Fed: Endangered State: Endangered	Annual herb. Occurs in vernal pools up to 2000 feet in elevation.	Low: This vernal pool species has a low potential to occur in seasonally ponded areas. This species is not expected to occur due to the lack of suitable

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			habitat and a high degree of disturbance.
Coulter's Saltbush (<i>Atriplex coulteri</i>)	CNPS list 1B.1 Fed: None State: None	Perennial herb. Occurs in alkaline or clay soils, open sites, coastal sage scrub, and coastal bluff scrub up to 1500 feet in elevation.	Low: This species has a low potential to occur.
Davidson's saltscale (<i>Atriplex serenana</i> var. <i>dauidsonii</i>)	CNPS list 1B.1 Fed: None State: None	Annual herb. Occurs in coastal bluff scrub and coastal scrub on alkaline soils from 10 to 820 feet in elevation.	Low: This species has a very low potential to occur due to lack of suitable habitat, high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.
Gambel's Watercress (<i>Nasturtium gambelii</i>)	CNPS list 1B.1 Fed: Endangered State: Threatened	Perennial Herb. Occurs in freshwater marshes, streamside banks, and along lake margins up to 1200 feet in elevation.	Low: This rare species has a very low potential to occur due to a high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.
Parish's Britttlescale (<i>Atriplex parishii</i>)	CNPS list 1B.2 Fed: None State: None	Annual Herb. Occurs in alkali playas and vernal pools up to 1000 feet in elevation.	Low: This species has a very low potential to occur due to lack of suitable habitat, high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.
Salt Spring Checkerbloom (<i>Sidalcea neomexicana</i>)	CNPS list 1B.2 Fed: None State: None	Perennial herb. Occurs in alkali sinks and coastal sage scrub up to 4500 feet in elevation.	Low: This species has a very low potential to occur due to a high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.

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San Bernardino Aster (<i>Symphyotrichum defoliatum</i>)	CNPS list 1B.2 Fed: None State: None	Perennial herb. Occurs in freshwater marshes, coastal sage scrub, and southern oak woodland up to 4921 feet in elevation.	Low: This species has a very low potential to occur due to lack of suitable habitat, high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.
Sanford's arrowhead (<i>Sagittaria sanfordii</i>)	CNPS list 2.2 Fed: None State: None	Perennial herb. Occurs in freshwater marshes up to 1000 feet in elevation.	Low: This species has a very low potential to occur due to a high degree of disturbance, the general lack of potential for species to recruit to the site from nearby source populations. and lack of suitable habitat.
Santa Barbara Morning-glory (<i>Calystegia sepium</i> ssp. <i>binghamiae</i>)	CNPS list 1B.2 Fed: None State: None	Perennial herb. Occurs in coastal salt marshes and along riverbanks up to 50 feet in elevation.	Low: This species has a very low potential to occur due to high degree of disturbance, and the general lack of potential for species to recruit to the site from nearby source populations.
Ventura Marsh Milk-vetch (<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>)	CNPS list 1A Fed: Endangered State: Endangered	Nearly extinct perennial herb. Occurs in disturbed areas around coastal salt marshes up to 300 feet in elevation.	Low: This species has a very low potential to occur due to its rarity and the general lack of potential for species to recruit to the site from nearby source populations.

*Data compiled from CNNDDB, 2012 for Seal Beach and Los Alamitos quadrangle, FWS.GOV, CNPS.org and Tidal Influence observations and research

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Table 5b. Status of known and potentially occurring special status animal species in Los Cerritos Wetlands.

Special Status Species	Status	Habitat	Potential to Occur On-Site
Fauna			
Belding's Savannah Sparrow (<i>Passerculus sandwichensis beldingi</i>)	Fed: None State: Endangered	Obligate to southern coastal salt marshes and nests in the upper marsh zone or in non-tidal marsh areas near tidal regions. This sparrow also utilize non-natural structures as perches and have been observed foraging on salt flats during high tides and on mudflats during low tides.	Present: The populations of Belding's Savannah Sparrows are regularly monitored by D. Zembal at Steamshovel Slough and good counts exist for other public lands within the LCW Complex. The largest population exists at Steamshovel Slough, while smaller populations persist on the LCWA Phase 1 and 2 properties. Birds are typically found within robust tidal salt marsh; however, where predator perches are absent, non-tidal environments adjacent to tidal habitat are utilized.
Black Skimmer (<i>Rynchops niger</i>)	Fed: None State: SSC	They are found nesting and roosting on open sandy beaches, shell bars with sparse vegetation or on mats of sea wrack in salt marshes. Feed on fish skimmed from the surface of the water.	Present: This species has been documented foraging in Steamshovel Slough and has a year-round presence on sandy beach areas in Long Beach

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Special Status Species	Status	Habitat	Potential to Occur On-Site
Burrowing Owl (<i>Athene cunicularia</i>)	Fed: None State: SSC	Primarily a grassland species, but also in some landscapes highly altered by human activity. The characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	Present: This species occurs within the LCW as a migratory winter visitor but is not expected as a breeding species. Individuals were observed during the study in oil operation areas on the eastern parcel of the LCWA Phase 1 properties .
California Least Tern (<i>Sterna antillarum browni</i>)	Fed: Endangered State: Endangered	Nests along the coast on bare or sparsely vegetated, flat substrates such as sandy beaches, alkali flats, land fills, or paved areas.	Present: This summer migrant has been identified foraging in open water areas and training offspring at Steamshovel Slough. Nesting reportedly occurred historically near Marketplace Marsh, but now only happens at the neighboring SBNWR.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Fed: None State: SSC	Breed mainly in shrublands or open woodlands and require tall perches for hunting. Utilize thorny shrubs for impaling prey.	Present: This species has been identified throughout the LCW Complex
Northern Harrier (<i>Circus cyaneus</i>)	Fed: None State: SSC	Breed and forage in a variety of open habitats that provide adequate vegetative cover including salt marsh, freshwater marshes and meadows.	Present: This species has been observed foraging throughout the LCW Complex.

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Special Status Species	Status	Habitat	Potential to Occur On-Site
Pacific Green Sea Turtle (<i>Chelonia mydas</i>)	Fed: Threatened State: None IUCN: Endangered	This circumglobal species is found in tropical seas and to a lesser extent in subtropical waters. Despite its worldwide distribution this marine turtle nests exclusively on tropical sandy beaches.	Present: This migratory reptile is a resident in the San Gabriel River and has also been observed throughout Alamitos Bay and in the Haynes cooling channel. The number of individuals within the San Gabriel River estuary has yet to be determined. Telemetry studies are underway to learn more about this species' use of the River.
Salt Marsh Tiger Beetles (<i>Cicindella trifasciata sigmoides</i>)	Fed: None State: None	This predatory beetle inhabits salt marshes, mudflats and salt pannes where they make burrows in the intertidal zone.	Present: This species has been documented on tidal mudflats at Steamshovel Slough and Zedler Marsh. Similar tiger beetles species are likely to be present as well.
Salt Marsh Wandering Skipper (<i>Panoquina errans</i>)	Fed: None State: SSC	Larvae use salt grass found in salt marsh and alkali meadow habitats. Adults nectar on salt marsh and upland plant species.	Present: This species is present throughout LCW within upper marsh and non-tidal stands of its host plant <i>Distichlis spicata</i>.
Short-eared Owl (<i>Asio flammeus</i>)	Fed: None State: WL	Suitable habitat include salt- and freshwater marshes, irrigated fields, and ungrazed grasslands.	Present: This species has been observed in LCW.
Yellow-Breasted Chat (<i>Icteria virens</i>)	Fed: None State: SSC	Nest in early successional riparian habitats with a well-developed shrub layer and an open canopy	Present: This species has been observed foraging throughout the LCW Complex.

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Special Status Species	Status	Habitat	Potential to Occur On-Site
Light-footed Clapper Rail (<i>Rallus longirostris levipes</i>)	Fed: Endangered State: Endangered	Obligate to southern coastal salt marshes and nests in tall and dense pacific cordgrass and sometimes in brackish marsh areas adjacent to salt marshes.	High: This secretive species has not been positively identified at LCW. However, there is high potential that individuals utilize LCW as a corridor to travel to and from the breeding grounds at SBNWR.
Western Snowy Plover (<i>Charadrius alexandrinus nivosus</i>)	Fed: Threatened State: SSC	This species occurs on sandy beaches, salt pond levees and along the shores of large alkali lakes. It needs sandy or gravelly substrates for nesting.	High: This species has not been positively identified making use of habitat within LCW, however, there is a high potential for this species to be present due to expansive salt flats. Flats are regularly used for foraging and loafing at other coastal salt marshes like LCW.
South Coast Marsh Vole (<i>Microtus californicus stephensi</i>)	Fed: None State: SSC	Inhabit coastal marshes	Moderate: Small mammal surveys in Seal Beach by Dudek (1995) found no individuals on the Hellman Retained or LCWA Phase 2 properties. This species has a moderate potential to occur in other areas like Steamshovel Slough throughout the LCW Complex.
Southern California Saltmarsh Shrew (<i>Sorex ornatus salicornicus</i>)	Fed: None State: SSC	Confined to coastal salt marshes in Orange, LA, and Ventura. It lives in Sarcocornia-Distichlis alliance.	Moderate: Small mammal surveys in Seal Beach by Dudek (1995) found no individuals on the Hellman Retained or LCWA Phase 2 properties. This species however has a moderate potential to occur in other areas like Steamshovel throughout the LCW Complex. They have been documented in Ballona Wetlands, SBNWR, Bolsa Chica and Mugu Lagoon.

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Special Status Species	Status	Habitat	Potential to Occur On-Site
Western Pond Turtle (<i>Emys marmorata</i>)	Fed: SSC State: SSC	Occupies a wide variety of permanent and intermittent fresh-brackish water wetlands habitats up to 5015 feet in elevation.	Moderate: The study site offers several freshwater marsh areas that could be suitable for this species to inhabit.
Western Yellow Bat (<i>Lasiurus xanthinus</i>)	Fed: None State: SSC	Primarily roost in trees hanging from the underside of leaves. Commonly found in dead fronds of non-native palms.	Moderate: With the extensive non-native palm tree populations at LCW this species has a moderate potential to occur on-site.
Coast Horned Lizard (<i>Phrynosoma blainvillii</i>)	Fed: None State: SSC	Occurs in coastal valley, foothill, scrub and riparian habitats. Feeds primarily on the native harvester ant.	Low: There is a low potential for the presence of this reptile because the food source for this species is not abundant due to the urbanization-influenced invasion of the Argentine ant.
Coastal California Gnatcatcher (<i>Poliophtila californica californica</i>)	Fed: Threatened State: SSC	Associated with mature coastal sage scrub vegetation communities on mesas, arid hillsides, and in washes. Nests almost exclusively in California sagebrush.	Low: This species has a low potential to occur within the LCW complex due to the lack of mature coastal sage scrub habitat that it depends upon.
Least Bell's Vireo (<i>Vireo bellii pusillus</i>)	Fed: Endangered State: Endangered	Most often found in willow dominated riparian habitats, but also occur in a variety of other wetland scrub habitats.	Low: This species has a low potential to occur within the LCW Complex due to limited mulefat scrub and willow scrub habitats.
Pacific Pocket Mouse (<i>Perognathus longimembris pacificus</i>)	Fed: Endangered State: None	Occupies loose sandy soils supporting sparse coastal sage scrub, non-native grassland, and ruderal habitats.	Low: Focused surveys in Seal Beach by Dudek (1995) found no individuals on the Hellman Retained or LCWA Phase 2 properties. Therefore, this species has a low potential to occur in other areas throughout the LCW Complex.

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Special Status Species	Status	Habitat	Potential to Occur On-Site
Southwestern Willow Flycatcher (<i>Empidonax trailii extimus</i>)	Fed: Endangered State: Threatened	Breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands including lakes and reservoirs at least 0.25 acres in size.	Low: This species has a low potential to occur in small fragments of willow scrub that exists in LCW
Tidewater Goby (<i>Eucyclobobius newberryi</i>)	Fed: Endangered State: Endangered	Inhabits benthic zone of shallow coastal lagoons and estuaries where brackish conditions occur.	Low: This species has a low potential to occur due to a lack of true estuarine conditions, however, focused fish surveys have not been completed at LCW for decades.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	Fed: None State: SSC	Often found in agricultural areas and nesting in freshwater marshes.	Low: This species has not been historically identified within the LCW Complex, but their nesting habitat does exist on site.
W. Yellow-billed Cuckoo (<i>Coccyzus americanus occidentalis</i>)	Fed: Candidate State: Endangered	Usually found in willow and cottonwood scrub plant communities and sometimes in walnut groves.	Low: This species has a very low potential for occurring in this study site due to a lack of preferred habitat.
Western Mastiff Bat (<i>Eumops perotis californicus</i>)	Fed: None State: SSC	Primarily roost in crevices and vertical cliffs and in broken terrain with exposed rock faces. May also be found in high building, trees and tunnels.	Low: The study site is devoid of preferred roosting habitat, however, they are such high flying animals that they can be challenging to survey and positively identify.

*Data compiled from CNNDDB, 2012 for Seal Beach and Los Alamitos quadrangle, FWS.GOV and Tidal Influence observations and research

4.0 SITE SPECIFIC HABITAT DESCRIPTIONS

In 1981, California Department of Fish and Game described much of the study area in a report entitled “Determination of the Status of Los Cerritos Wetlands”. However, this report did not include all of the properties described below. Through the years, individual land owners have also funded ecological studies. These investigations were not done for the purpose of wetlands restoration and were compiled to delineate wetlands areas for future urban development as part of the CEQA process. Inconsistencies are apparent when comparing these documents with each other and with the current existing conditions, but they still provide some insight into the existing conditions at Los Cerritos Wetlands.

The study area was divided into ten subareas. These subareas were determined based on current land ownership and adjacency to habitat landmarks. **The location of each subarea is detailed in Figure 3 (revisited below) and each subarea’s ownership, dominant habitat types, current land uses, invasive species populations, wildlife corridors and other details are described below.** In addition, the habitat type acreage of each subarea is identified in Table 6.



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Table 6. Habitat type acreage by subareas*

Habitat Type	LCWA 1	LCWA 2	MM	BRW	Bryant	HCC	Hellman	Loynes	OCRB	Slough	Total
Southern Coastal Salt Marsh	2.75	12.64	3.10	18.70	0.22	0.81	0.00	-	-	24.54	62.76
Southern Coastal Brackish Marsh	1.79	-	7.19	8.29	-	-	-	-	-	-	17.28
Alkali Meadow	7.56	-	7.34	16.99	9.50	-	-	-	-	0.00	41.40
Mulefat Scrub	2.26	-	1.61	0.52	0.02	-	-	-	-	0.13	4.54
Southern Willow Scrub	-	-	0.29	-	-	-	-	-	-	-	0.29
Salt Flats	3.79	9.92	0.64	25.14	2.25	0.09	-	-	-	5.22	47.05
Subtidal Marine	16.52	1.17	-	1.43		18.00	-	-	-	17.65	54.77
Rip-rap	2.82	-	-	-	-	1.15	-	-	-	-	3.97
Mudflat	-	-	-	0.07	-	-	-	-	-	8.35	8.42
Ruderal Wetlands	4.70	3.18	2.79	12.36	4.03	0.40	23.95	-	33.53	-	84.95
Ruderal Uplands	11.73	68.72	5.97	4.11	0.17	2.80	2.28	9.45	0.20	12.73	118.17
Vegetation Free Zone	16.38	1.93	7.89	22.55	1.82	7.93	15.99	-	4.12	-	78.61
Development	0.75	2.31	0.54	1.03	-	2.93	3.07	-	4.90	-	15.52
Total	71.05	99.88	37.36	111.20	18.00	34.12	45.29	9.45	42.75	68.62	537.71

*Data collected by Tidal Influence and adapted from AECOM, 2011

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DISCLAIMER: * indicates subareas that were accessible and surveyed in detail for habitat types and special status species. All other subareas were superficially surveyed and require further investigations.

4.1 LCWA Phase 1*

General Description: Historically this property was entirely coastal salt marsh. The surface rights to this subarea were acquired by the LCWA in 2006; a transaction made possible through a partnership with Signal Hill Petroleum Inc. which purchased the property's mineral rights. These 66 acres include parcels on both sides of the San Gabriel River just east of the Marketplace Marsh and west of the Haynes Cooling Channel. This area includes a majority San Gabriel River's subtidal habitat between 2nd St. and Pacific Coast Highway (P.C.H.). Also included in LCWA Phase 1 is an approximately 5-acre industrial parcel at the corner of Studebaker Rd and 2nd St., commonly referred to as the OTD parcel.

The eastern parcel, commonly referred to as the isthmus, is located on a narrow strip of land between the River and Haynes Cooling Channel. Currently, tidal exchange with the San Gabriel River supports a three acre tidal salt marsh, (Zedler Marsh), on the eastern parcel. Zedler Marsh has been the focus of restorative efforts by the LCWA's Stewardship Program. As a surviving portion of the historic San Gabriel River channel, the marsh currently supports at least one pair of Belding's Savannah Sparrows, foraging habitat for California least terns, and several species of rare plants. The eastern parcel also contains a mixture of alkali meadow and mulefat scrub habitats adjacent to Zedler Marsh. The remainder of the eastern parcel contains ruderal habitats and vegetation free zones created by an exclusive oil lease easement and tank farm.

The western parcel is non-tidal. It is composed of a mixture of wetlands habitats transitioning from salt flats to more freshwater wetlands types and vegetation free zones. In some areas salinity levels have been reduced so much that exotic upland trees have become established. The parcel is fragmented by oil operation roadways, pipelines, power lines, and pumps. However, Belding's Savannah Sparrows have been observed on the site utilizing alkali meadow habitat adjacent to the San Gabriel River.



The stretch of river between the two parcels of land is known to be habitat for the Pacific green sea turtle.

Restoration Potential: The San Gabriel River and Haynes cooling channel are potential sources for improved tidal connections to this subarea. The alkali meadow, salt flats, ruderal wetlands and ruderal uplands on the western parcel offer great potential for restoration of tidal salt marsh through hydrological alterations. Disruptive alteration to Zedler Marsh as part of the large-scale restoration project should be avoided as this site is the subject of a LCWA restoration project funded by USFWS and by an MOA with the Coastal Commission.

4.2 LCWA Phase 2*

General Description: This 100 acre subarea is in Seal Beach just east of the Haynes Cooling Channel and bordered by residential areas to the southeast. The northern border is jagged as it closely traces the Hellman Properties LLC oil operations. The property was designated as ‘deed-restricted wetlands’ as mitigation for the Heron Pointe development and was purchased in late 2010 by the LCWA.

Historically, the majority of this property was coastal salt marsh and has been converted to mostly ruderal uplands due to extensive filling. A narrow and fragmented muted tidal creek now bisects this property and distributes tidal waters into about ten remaining acres of salt marsh that supports as many as ten pairs of Belding’s Savannah Sparrows and several patches of Coulter’s goldfields. A portion of this channel follows a historic channel that once traversed the landscape. Several hypersaline salt flat regions border the salt marsh as well as a few patches of southern tarplant.

Geomorphologic features of a remnant southern coastal bluff system exists along the southeastern portion of the property. Fill was piled up against this bluff and the resultant disturbance has destroyed the native plant community save a few *Cleome isomeris* (bladderpod) individuals. Otherwise, non-native plants dominate the uplands. Black mustard, *Brassica nigra*, covers much of the vegetated upland areas and has the largest extent of all the non-native plant species. The mustard stands provide cover for coyotes that use this property and attract an abundance of small seed eating birds that are preyed upon by a well documented raptor community. Stipulations are placed on the land that requires the creation of a 9.2-acre grassland for raptor foraging habitat.

Two large sandy fill areas exist on the property that support only low growing vegetation. The sandy site referred to as ‘Area 18’ is one of the highest fill areas and is known to cover contaminated soils created by the disposal of “tank bottom sludge” from past oil operations. The other sand fill area is known to be a historic land fill dump and is filled with construction debris (Anchor Environmental and Everest International Consultants, 2003). Both of these sandy deposits support populations of the rare *Camissonia lewisii* (Lewis’ primrose).

Restoration Potential: The extensive ruderal upland areas on this property have the potential to be restored into Diegan coastal sage scrub, southern dune scrub, or southern coastal bluff scrub through enhancement efforts to control non-native plants, soil remediation, and the introduction of appropriate native plant species. Alterations to the upland areas also offer the opportunity to plan for sea-level rise and provide locations for future coastal salt marsh vertical migration. The existing salt marsh has potential to be expanded without impacting the sensitive habitat it currently supports.



Photo 27: Sandy fill area on LCWA Phase2

4.3 Marketplace Marsh*

General Description: Around 33 acres of this subarea were acquired by the City of Long Beach in 2010. The site is bordered by 2nd street, the Marketplace Shopping Center, and the LCWA Phase 1 western parcel. This site was the subject of a wetland delineation study in 2011 that found wetland habitat and disturbed land cover associated with oil operations (AECOM, 2011). A portion of another smaller parcel is included in the subarea.. This parcel is owned currently by Lyon Communities and is located between the River and the Marketplace Shopping Center.



The most notable feature of this subarea is an approximately five acre brackish marsh called ‘Marketplace Marsh.’ The sizeable marsh is composed of dense mixed stands of *Typha latifolia* (broadleaf cattail), *Typha domingensis* (southern cattail), *Schoenoplectus americanus* (chairmaker’s bulrush), and *Schoenoplectus californicus* (California bulrush), with small patches of *Schoenoplectus robustus* (salt marsh bulrush) nearby. Open areas between the thickets are covered in *Azolla filiculoides* (water fern) during the wet season and remain unvegetated during the dry season. Some of these open areas are being invaded by the non-native invasive *Tamarisk ramosissima* (salt cedar). This brackish marsh persists in these salty soil conditions due to a freshwater input from storm runoff generated by the Marketplace Shopping Center’s watershed. Increased freshwater flows have begun to transform this site into a freshwater marsh.

A mixture of alkali meadows, southern willow scrub, mulefat scrub, and small brackish marsh wetland plant communities surround Marketplace Marsh. Salt flats also occur in some of the shallow basins created by the dirt roadways that traverse the property. During the highest tides of the year, an area of very muted tidal salt marsh habitat in the southern corner of the property receives sea water flows from a leaky culvert connected to the San Gabriel River.

These degraded salt marsh habitats are characterized as having less diverse plant communities. They are generally dominated by large patches of individual salt marsh plant species and scattered salt tolerant non-native species like *Bassia hyssopifolia* (five-hook *Bassia*) and *Polypogon monspeliensis* (rabbits foot grass). During field visits in July 2011, Belding’s Savannah Sparrows were not observed in these non-tidal salt marshes likely due to a prominence of predator perches (Bosler, 2011).



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The portion of this property owned by Lyon Communities is composed of about 5 acres of land fill that is well above sea level and maintained without vegetation. The fill site is a documented former least tern nesting site, but now serves as a seasonal commercial property known locally as “Pa’s Pumpkin Patch.” Lyon’s Communities land holdings also include a small portion of the salt marsh habitat described above, which was the only area analyzed in this report.

Restoration Potential: Marketplace Marsh has potential to be enhanced with connections to adjacent basins and by removal of non-native plants. The portion of the subarea near the San Gabriel River has potential to be better connected to the tides through improvements to the leaky culvert or alterations to the levees. Reintroduction of tidal water to this area should be controlled in order to protect some of the non-tidal wetland resources that currently exist.

4.4 Steamshovel Slough*

General Description: This subarea encompasses two distinct areas, the Steamshovel Slough wetlands area as well as a portion of the Los Cerritos Channel. The Steamshovel Slough wetlands area is the only portion of privately owned property that was made fully accessible for this study and therefore detailed habitat surveys were performed for this approximately 35 acre tidal salt marsh. Tidal connection to Alamos Bay is provided via the Los Cerritos Channel and this fully tidal salt marsh currently has the highest habitat value in the LCW Complex. This remnant channel is a geomorphological relic that supports intact and biodiverse salt marsh habitat that is the exemplary model of what much of Los Cerritos Wetlands looked like 150 years ago.

Steamshovel Slough contains all three of the marsh zones including dense stands of Pacific cordgrass and several large salt pannes (Apodaca, 2005). The middle and upper marsh zones support expansive *Suaeda esteroa* populations and several patches of *Suaeda taxifolia*. The Slough empties completely at low tides exposing extensive intertidal mudflat habitat as well as eelgrass beds near the mouth. This area also hosts a sizeable breeding population of Belding’s savannah sparrows, acts as a training ground for least tern fledglings, is a major migratory waterfowl and shorebird bird refuge, and provides excellent conditions for future establishment of endangered salt marsh birds, clapper rail populations.

The portion of the Los Cerritos Channel that is included in this subarea is known to support eelgrass beds that sometimes attracts foraging fishes, sea lions and other marine mammals. These beds however were not surveyed or mapped as part of this study. The Channel’s mostly rubble and fill material are vegetated by salt marsh plants.



Photo 30: Steamshovel Slough

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Restoration Potential: Limited ecological enhancements are needed in this subarea. The transition zone and surrounding uplands have potential to be improved to reduce urban impacts on Steamshovel Slough. There is also potential for restoring historic tidal channels that would connect the Slough to the Bixby Ranch Wetlands.

4.5 Bixby Ranch Wetlands

General Description: This 150 acre area is the largest contiguous stretch of wetlands in the complex and is bordered by Studebaker road to the east, 2nd Street to the south, and P.C.H. to the west. The majority of the property is currently owned by LCW Partners LLC, with a small portion under the ownership of Alamitos Bay Partnership LLC. LCW Oil Operation and Termo Oil are the respective lessees.

About ten acres of muted tidal salt marsh habitat occurs on this property where Steamshovel Slough is connected to the oil fields by a series of culverts near the property line between Alamitos Bay Partners and LCW Partners. The culverts convey marine water into a group of basins that were designed to transfer rain water from the oil fields out into Alamitos Bay. Salt marsh habitat is well established in several of these muted tidal basins. Some of the basins contain subtidal water and Pacific cordgrass. Furthermore, non-tidal salt marsh habitat occurs along some of the areas that are adjacent to Steamshovel Slough. This upper marsh habitat is breeding grounds for Belding's savannah sparrow.

Much of the central area supports salt flats, while areas nearer roadsides appear to be mixture of ruderal wetlands, brackish wetlands, willow scrub, and alkali meadows.

A high elevation fill area, part of a former burn dump, exists along the eastern boundary of this property. This upland area is dominated by ruderal vegetation and rubble.

The remainder of the property is primarily used for mineral extraction facilities.

Restoration Potential: This is one of the most dynamic subareas and offers the opportunity to restore several different habitat types including coastal sage scrub, salt marsh, brackish marsh and other non-tidal wetlands. Historic maps indicate tidal channels extending from Steamshovel Slough into portions of this subarea which offers an opportunity for 'true restoration' of tidal salt marsh habitat. Furthermore, there is potential to enhance the muted tidal salt marsh areas through improvements to the tidal connections and by connecting basins containing salt flat or alkali meadow habitats to tidal exchange. The urban edges have potential to be enhanced to best capture and filter run-off and improve willow scrub and brackish marsh habitats.

4.6 Hellman Retained

General Description: This approximately 45-acre sub-area is an active oil field owned by Hellman Properties LLC. It is bordered by the OC retention basin to the north, the Haynes cooling channel to the west, and the LCWA Phase 2 property to the south. This property is also adjacent to an approximately seven acre willow scrub (not analyzed in this report) created to receive



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storm water control from the Heron Pointe development to the east. The land is currently operated exclusively for mineral extraction and contains a complex matrix of pipelines, pumps, tanks, and roadways. Detailed habitat surveys were not been completed on this property as part of this study, but past studies indicate that several special status plant species exist on site (Glenn Lukos Associates, 2010). Based on the presence of those plants species we assume that much of the area contains hydrophytic wetland vegetation. Historically this area was coastal salt marsh and now appears to be composed almost entirely of ruderal wetlands that are annually disked to control vegetation within their oil operation footprint.

Restoration Potential: This property's high elevation, current land use, and ruderal condition makes it an attractive option to allow for the future migration of salt marsh habitat as sea level rises. Its proximity to the Haynes cooling channel is also an attractive attribute for future restoration. Considering this property has been utilized for mineral extraction since the 1930's this site will likely be constrained by hydrocarbon soil contamination.

4.7 Bryant Retained

General Description: As part of the land sale to the LCWA in 2006, Bryant-Dankin LLC retained three parcels that extend across the San Gabriel River and Haynes Cooling Channel along 2nd St./Westminster Ave. The westernmost parcel is approximately 10 acres in size and runs along 2nd Street. It includes wetlands habitats similar to those found on the LCWA Phase 1 western parcel and the City of Long Beach's Marketplace Marsh property. The middle parcel is a six acre parcel located on the isthmus just north of Zedler Marsh. It contains wetlands and the only natural population of the rare *Juncus acutus leopoldii* (southwestern spiny rush). The eastern parcel is a 3-acre property that is currently the site of a development to upgrade the OC Retention Basin's pump house. It reportedly once hosted upper marsh vegetation, but now appears to contain limited habitat value after being developed (UltraSystems Environmental, 2008).

Restoration Potential: The two westernmost Bryant Retained parcels have great potential to be included in the restoration plans for the LCWA Phase 1 subarea. The middle parcel could be connected to Zedler Marsh or receive tidal exchange from the Haynes cooling channel or San Gabriel River. The easternmost parcel has been developed and now has little restoration potential.

4.8 OC Retention Basin

General Description: This approximately 40-acre subarea borders the Hellman Retained property as well as residential area to the north and a commercial area to the east. It is used as a flood control facility for a portion of southwest Orange County. The land is owned by the County of Orange and operated by the Orange County Flood Control District. From the perimeter, the basin appears to contain ruderal wetlands habitat, however focused surveys are



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needed to determine the exact habitat types that may be present. The basin currently serves as a migratory stopover site for Canada geese and other water fowl

Restoration Potential: Restoration of this site is constrained due to its need to retain flood control capacity.

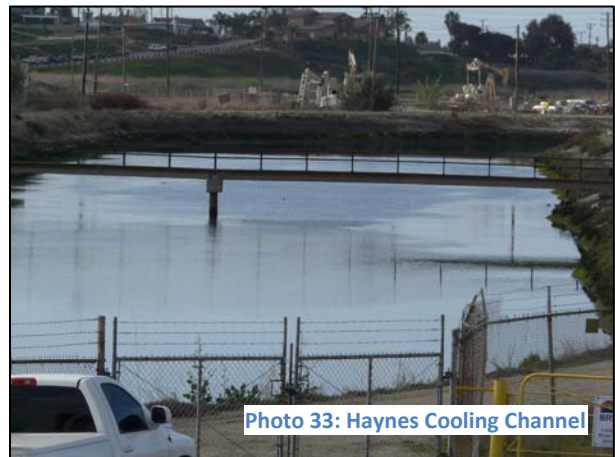
4.9 Loynes Property

General Description: This approximately 9-acre property is owned by Loynes LLC and is the site of a former land fill that was recently disturbed. This disturbance was well documented and several biological reports were prepared as a result. According to reports the site once hosted brackish marsh habitat as well as ruderal wetlands (Land Protection Partners, 2009). Post-disturbance, the site appears to be composed of ruderal uplands, though habitat surveys were not performed on this property as part of this study.

Restoration Potential: This property has special conditions placed on it by the California Coastal Commission through a mandated Coastal Development Permit. A habitat revegetation and monitoring plan for the site was recently developed by the landowner (LSA Associates Inc., 2011).

4.10 Haynes Cooling Channel

General Description: The City of Los Angeles Department of Water and Power owns about 27 acres that include the Haynes Cooling Channel, a small salt marsh area called Calloway Marsh, and a portion of the San Gabriel River just north of the P.C.H. bridge. The San Gabriel River flowed naturally through this area in 1883 and now serves as a human-made channel that conveys water upstream from Alamitos Bay to the Haynes Generating Station. The channel is a popular fishing spot for both humans and birds as a variety of fish (including California halibut, diamond turbot, and round stingray) are attracted to the moving water as it enters the channel. California least terns utilize the channel in the summer for foraging habitat, while migratory water fowl and shore birds are abundant in the winter. The channel banks are steep and are fringed with intertidal salt marsh vegetation. The cooling channel has the potential to be an excellent source of tidal waters for the LCWA Phase 2 and Hellman Retained properties.



Calloway Marsh is a one acre tidal salt marsh that is connected to the River by a three foot wide culvert. The marsh is perched and only is flooded during the highest tides. The salt marsh plant community is surrounded by ruderal uplands that support a population of California ground squirrels. We observed burrowing owls using ground squirrel burrows at this location.

Also included in this subarea is a developed property owned by the State Lands Commission. This is the former site of the 'Airport Club' a.k.a 'Marina Palace.' The buildings foundation and

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parking lot are still in place. The parking lot area currently supports southern tarplant. The building foundation borders the tidal creek that feeds the LCWA Phase 2 parcel.

Restoration Potential: Haynes cooling channel is a potential source of seawater for the restoration of intertidal habitat in the LCWA Phase 1 & 2 and Hellman Retained subareas. Calloway Marsh's heavily degraded condition offers a potential site for future mitigation projects or for creating a connection between the San Gabriel River and Haynes cooling channel. The mostly developed State Lands Commission parcel has limited habitat value but could be enhanced with native landscaping that includes improvements to the bordering tidal creek.

5.0 CONCLUSIONS

The extensive disturbed habitat at Los Cerritos Wetlands offers an enormous potential for restoration of coastal habitats. Ruderal Wetlands (15.8%) and Ruderal Uplands (22.0%) make up 37.8% of the land cover with the study site. Vegetation free zones (14.6%) and developments (2.9%) cover another 17.5% of the study site. This means that 55.3% of the study site currently supports areas that have little to no habitat value. Furthermore, another 12.5% of the study site is composed of marine habitats.

About one third (32.2%) of the study site is composed of discernable wetland habitats and of that acreage, 11.7% are tidal wetlands. This is a dramatic shift from 1873 when an estimated 88.5% of the land encompassed by the study site boundaries was tidal wetland habitat.

Our observations of the existing habitats have led us to determine a successional process that is occurring for non-tidal wetland habitat types as plant communities recover from historic disturbances. The existing non-tidal habitat types appear to be in transition as freshwater has diluted the salt content of the soil, creating current conditions that invite less salt-tolerant hydrophytes to invade the landscape.

Filled Southern Coastal Salt Marsh degraded into Salt Flats →→ Alkali Meadows →→ Southern Coastal Brackish Marsh →→ Mulefat Scrub →→ Southern Willow Scrub

Or

Filled Southern Coastal Salt Marsh degraded into Salt Flats →→ Alkali Meadows →→ Southern Coastal Brackish Marsh →→ Freshwater Marsh

If left in its current environmental condition much of the Los Cerritos Wetlands Complex will become dominated by a mixture of freshwater wetland types bordered by ruderal uplands. However, the successional pattern observed is not apparent at Steamshovel Slough. This full tidal salt marsh appears to have changed little over the decades and is a model climax coastal salt marsh plant community. It is likely that this stability is due to its full tidal conditions and lack of major landform alteration. Therefore, the reintroduction of tidal influence to non-tidal wetland areas will allow for Los Cerritos Wetlands to become a self-sustaining urban wetland.

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Appendix A:

Floral and Faunal Database



Animal Species*

Group	Genus species	Common Name
Invertebrates		
	Crustaceans	
	Crawfish	<i>Procalmbalrus sp.</i>
	Purple Shore Crab	<i>Hemigrapsus nudus</i>
	Red Ghost Shrimp	<i>Callianassa californiensis</i>
	Striped Shore Crab	<i>Pachygrapsus crassipes</i>
	Yellow Shore Crab	<i>Hemigrapsus oregonensis</i>
	Gastropods	
	California Horn Snail	<i>Cerithidea californica</i>
	Cloudy Bubble Snail	<i>Bulla gouldiana</i>
	Green Paper Bubble Snail	<i>Haminoea virescens</i>
	Sea Hare	<i>Aplysia californica</i>
	Striped Sea Hare	<i>Navanax inermis</i>
	Bivalves	
	Bay Mussel	<i>Mytilus edulis</i>
	California Jackknife Clam	<i>Tagelus californianus</i>
	Common Littleneck Clam	<i>Protothaca staminea</i>
	Olympia Oyster	<i>Ostrea lurida</i>
	Ribbed Horse Mussel	<i>Modiolus demissus</i>
	Cephalapods	
	Two-spot Octopus	<i>Octopus bimaculoides</i>
	Insects and Arachnids	
	Acreea Moth	<i>Estigmene acreea</i>
	Green Lynx Spider	<i>Peucetia viridans</i>
	Monarch Butterfly	<i>Danaus plexippus</i>
	Mudflat Tiger Beetle	<i>Cicindela trifasciata sigmoidea</i>
	Pygmy Blue Butterfly	<i>Brephidium exilis</i>
	Rove Beetle	<i>Bledius ssp.</i>
	Saldid Bug	<i>Pentacora signoreti</i>
	Salt Marsh Tiger Beetle	<i>Cicindela hemorrhagica hemorrhagica</i>
	Salt Marsh Wandering Skipper	<i>Panoquina errans</i>
	Sand Wasp	<i>Bembix comata</i>
	Tarantula Hawk	<i>Pepsis ssp.</i>
Marine Fishes		
	Arrow Goby	<i>Clevelandia ios</i>
	Bay Pipe Fish	<i>Syngnathus griseolineatus</i>
	California Killifish	<i>Fundulus parvipinnis</i>
	Round Sting Ray	<i>Urobatis haleri</i>
	Staghorn Sculpin	<i>Leptocottus armatus</i>
	Stripped Mullet	<i>Mugil cephalus</i>
	Topsmelt	<i>Atherinops affinis</i>
Amphibians		
	Baja California Treefrog	<i>Pseudacris hypochondriaca</i>
Reptiles		
	Gopher Snake	<i>Pituophis melanoleucus</i>
	Pacific Green Sea Turtle	<i>Chelonia midas</i>
	Red Diamond Rattlesnake	<i>Crotalus ruber</i>
	Side-blotched Lizard	<i>Uta stansburiana</i>

Animal Species*

Group	Genus species	Common Name
Reptiles		
	Southern Alligator Lizard	<i>Gerrhonotus multicarinatus</i>
	Western Fence Lizard	<i>Sceloporus occidentalis</i>
Birds		
	Allen's Hummingbird	<i>Selasphorus sasin</i>
	American Avocet	<i>Recurvirostra americana</i>
	American Bittern	<i>Botaurus lentiginosus</i>
	American Coot	<i>Fulica americana</i>
	American Crow	<i>Corvus brachyrhynchos</i>
	American Goldfinch	<i>Carduelis tristis</i>
	American Kestrel	<i>Falco sparverius</i>
	American pipit	<i>Anthus rubescens</i>
	American White Pelican	<i>Pelecanus erythrorhynchos</i>
	American Widgeon	<i>Anas americana</i>
	Anna's Hummingbird	<i>Calypte anna</i>
	Ash-thoated Flycatcher	<i>Myiarchus cinerascens</i>
	Barn Owl	<i>Tyto alba</i>
	Barn Swallow	<i>Hirundo rustica</i>
	Belding's Savannah Sparrow	<i>Passerculus sandwichensis beldingi</i>
	Belted Kingfisher	<i>Ceryle alcyon</i>
	Black Pheobe	<i>Sayornis nigricans</i>
	Black Skimmer	<i>Rynchops niger</i>
	Black-bellied Plover	<i>Pluvialis squatarola</i>
	Black-chinned Humminbird	<i>Archilochus alexandri</i>
	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Black-necked Stilt	<i>Himantopus mexicanus</i>
	Blue-gray Gnatcather	<i>Polioptila caerulea</i>
	Blue-winged Teal	<i>Anas discors</i>
	Bonaparte's Gull	<i>Larus philadelphia</i>
	Brant	<i>Branta bernicla</i>
	Bufflehead	<i>Bucephala albeola</i>
	Bullock's Oriole	<i>Icterus bullockii</i>
	Burrowing Owl	<i>Athene cunicularia</i>
	California Brown Pelican	<i>Pelecanus occidentalis</i>
	California Gull	<i>Larus californicus</i>
	California Least Tern	<i>Sternula antillarum browni</i>
	California Towhee	<i>Pipilo crissalis</i>
	Canada Geese	<i>Branta canadensis</i>
	Caspian Tern	<i>Hydroprogne caspia</i>
	Cassin's Kingbird	<i>Tyrannus vociferans</i>
	Cedar Waxwing	<i>Bombycilla cedrorum</i>
	Cinnamon Teal	<i>Anas cyanoptera</i>
	Clark's Grebe	<i>Aechmorphus clarkii</i>
	Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
	Common Loon	<i>Gavia immer</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>

Animal Species*

Group	Genus species	Common Name
Birds		
	Common Yellowthroat	<i>Geothlypis trichas</i>
	Cooper's Hawk	<i>Accipiter cooperii</i>
	Double-crested Cormorant	<i>Phalacrocorax auritus</i>
	Downy Woodpecker	<i>Picoides pubescens</i>
	Eared Grebe	<i>Podiceps nigricollis</i>
	Elegant Tern	<i>Thalasseus elegans</i>
	Forster's Tern	<i>Sterna forsteri</i>
	Gadwall	<i>Anas strepera</i>
	Great Blue Heron	<i>Ardea herodias</i>
	Great Egret	<i>Ardea alba</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Greater Scaup	<i>Aythya marila</i>
	Greater Yellowlegs	<i>Tringa melanoleuca</i>
	Great-tailed Grackle	<i>Quiscalus mexicanus</i>
	Green Heron	<i>Butorides virescens</i>
	Green-Winged Teal	<i>Anas crecca</i>
	Heermann's Gull	<i>Larus heermanni</i>
	Hermit Thrush	<i>Catharus guttatus</i>
	Hooded Oriole	<i>Icterus cucullatus</i>
	Horned Grebe	<i>Podiceps auritus</i>
	House Finch	<i>Carpodacus mexicanus</i>
	House Wren	<i>Troglodytes aedon</i>
	Killdeer	<i>Charadrius vociferous</i>
	Least Sandpiper	<i>Calidris minutilla</i>
	Lesser Scaup	<i>Aythya affinis</i>
	Light-footed Clapper Rail	<i>Rallus longirostris levipes</i>
	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Long-billed Curlew	<i>Numenius americanus</i>
	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
	Mallard	<i>Anas platyrhynchos</i>
	Marbled Godwit	<i>Limosa fedosa</i>
	Marsh Wren	<i>Cistothorus palustris</i>
	Merlin	<i>Falco columbarius</i>
	Mourning Dove	<i>Zenaida macroura</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Northern Pintail	<i>Anas acuta</i>
	Northern Shoveler	<i>Anas clypeata</i>
	Orange Bishop	<i>Euplectes franciscanus</i>
	Osprey	<i>Pandion haliaetus</i>
	Pacific-slope Flycatcher	<i>Empidonax difficilis</i>
	Pacific Loon	<i>Gavia pacifica</i>
	Peregrine Falcon	<i>Falco peregrinus</i>
	Pied Billed Grebe	<i>Podilymbus podiceps</i>
	Red-brested Merganser	<i>Mergus serrator</i>

Animal Species*

Group	Genus species	Common Name
Birds	Reddish Egret	<i>Egretta refescens</i>
	Red-necked Phalarope	<i>Phalaropus lobatus</i>
	Red-shouldered Hawk	<i>Buteo lineatus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	Ring-billed Gull	<i>Larus delawarensis</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Ruddy Duck	<i>Oxyura jamaicensis</i>
	Say's Pheobe	<i>Sayornis saya</i>
	Semipalmated Plover	<i>Charadrius semipalmatus</i>
	Short-billed Dowitcher	<i>Limnodromus griseus</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Snowy Egret	<i>Egretta thula</i>
	Sora	<i>Porzana carolina</i>
	Spotted Sandpiper	<i>Actitis macularia</i>
	Surf Scoter	<i>Melanitta perspicillata</i>
	Turkey Vulture	<i>Cathartes aura</i>
	Violet-green Swallow	<i>Tachycineta thalassina</i>
	Western Bluebird	<i>Sialia mexicana</i>
	Western Grebe	<i>Aechmorphus occidentalis</i>
	Western Gull	<i>Larus occidentalis</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Western Meadowlark	<i>Sturnella neglecta</i>
	Western Sandpiper	<i>Calidris mauri</i>
	Western Scrubjay	<i>Aphelocoma californica</i>
	Whimbrel	<i>Numenius phaeopus</i>
	White Tailed Kite	<i>Elanus leucurus</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
	White-faced Ibis	<i>Plegadis chihi</i>
	Willet	<i>Tringa semipalmatus</i>
	Wilson's Phalarope	<i>Phalaropus tricolor</i>
	Wilson's Snipe	<i>Gallinago delicata</i>
	Yellow-breasted Chat	<i>Icteria virens</i>
	Yellow-rumped Warbler	<i>Dendroica coronata</i>
Mammals	Coyote	<i>Canis latrans</i>
	American Opossum	<i>Didelphis virginiana</i>
	Audubon's Cottontail Rabbit	<i>Sylvilagus audubonii</i>
	Botta's Pocket Gopher	<i>Thomomys bottae</i>
	California Ground Squirrel	<i>Otospermophilus beecheyii</i>
	California Sea Lion	<i>Zalophus californianus</i>
	Harbor Seal	<i>Phoca vitulina</i>
	House Mouse	<i>Mus musculus</i>
	Human	<i>Homo sapien sapien</i>
	Raccoon	<i>Procyon lotor</i>
	Western Harvest Mouse	<i>Reithrodontomys megalotis limicola</i>

*Data collected by Tidal Influence and LCWA Stewardship Program

Native Plant Species *

Habitat	Genus species	Common Name
Marine		
	<i>Zostera marina</i>	Common Eelgrass
Lower Salt Marsh		
	<i>Spartina foliosa</i>	Pacific Cordgrass
Mid Salt Marsh		
	<i>Batis maritima</i>	Saltwort
	<i>Cuscuta salina</i>	Salt Marsh Dodder
	<i>Frankenia salina</i>	Alkali Heath
	<i>Jaumea carnosa</i>	Fleshy Jaumea
	<i>Limonium californicum</i>	Sea Lavender
	<i>Salicornia bigelovii</i>	Annual Pickleweed
	<i>Salicornia pacifica</i>	Common Pickleweed
	<i>Suaeda esteroa</i>	Estuary Sea-blite
	<i>Suaeda calceoliformis</i>	Horned Sea-blite
	<i>Triglochin concinna</i>	Arrow-grass
Upper Salt Marsh		
	<i>Arthrocnemum subterminale</i>	Glasswort
	<i>Atriplex watsonii</i>	Watson's Salt Bush
	<i>Cressa truxillensis</i>	Alkali Weed
	<i>Distichlis spicata</i>	Salt Grass
	<i>Distichlis littoralis</i>	Shore Grass
	<i>Spergularia marina</i>	Sand Spurrey
Transition Zone		
	<i>Amblyopappus pusillus</i>	Pineapple Weed
	<i>Aster subulatus</i>	Salt Marsh Aster
	<i>Centromadia parryi ssp. australis</i>	Southern Tarplant
	<i>Isocoma menziesii</i>	Coast Goldenbush
	<i>Lasthenia glabrata ssp. coulteri</i>	Coulter's Goldfields
	<i>Lycium californicum</i>	California Boxthorn
	<i>Pluchea odorata var. odorata</i>	Salt Marsh Fleabane
	<i>Suaeda taxifolia</i>	Woolly Sea-blite
Freshwater Wetlands		
	<i>Anemopsis californica</i>	Yerba Mansa
	<i>Azolla filiculoides</i>	Pacific Mosquito Fern
	<i>Cyperus eragrostis</i>	Tall Flatsedge
	<i>Eleocharis macrostachya</i>	Spike Rush
	<i>Juncus acutus ssp. leopoldii</i>	Spiny Rush
	<i>Juncus bufonius</i>	Toad Rush
	<i>Juncus mexicanus</i>	Mexican Rush
	<i>Elymus triticoides</i>	Alkali Rye

Native Plant Species *

Habitat	Genus species	Common Name
Freshwater Wetlands	<i>Salix gooddingii</i>	Black Willow
	<i>Salix laevigata</i>	Red Willow
	<i>Salix lasiolepis</i>	Arroyo Willow
	<i>Schoenoplectus americanus</i>	Chairmaker's Bulrush
	<i>Schoenoplectus californicus</i>	California bulrush
	<i>Bolboschoenus robustus</i>	Salt Marsh Bulrush
	<i>Typha domingensis</i>	Southern Cattail
	<i>Typha latifolia</i>	Broadleaf Cattail
	<i>Xanthium strumarium</i>	Cocklebur
Upland	<i>Ambrosia acanthicarpa</i>	Annual Burweed
	<i>Ambrosia psilostachya</i>	Western Ragweed
	<i>Artemisia californica</i>	California Sagebrush
	<i>Atriplex lentiformis</i>	Quail Bush
	<i>Baccharis salicina</i>	Emory's Baccharis
	<i>Baccharis pilularis</i>	Coyote Brush
	<i>Baccharis salicifolia</i>	Mulefat
	<i>Baccharis sarthoides</i>	Broom Baccharis
	<i>Camissoniopsis lewisii</i>	Lewis' Primrose
	<i>Centromadia pungens</i>	Common Tarweed
	<i>Peritoma arborea</i>	Bladderpod
	<i>Galium angustifolium</i>	Bedstraw
	<i>Heliotropium curassavicum</i> var. <i>oculatum</i>	Seaside Heliotrope
	<i>Laennecia coulteri</i>	Coulter's Horsetail
	<i>Acmispon glaber</i>	Deerweed
	<i>Malosma laurina</i>	Laurel Sumac
	<i>Malvella leprosa</i>	Alkali Mallow
	<i>Solanum americanum</i>	White Nightshade
	<i>Solanum douglasii</i>	Douglas Nightshade
	<i>Stephanomeria virgata</i>	Twiggy Wreath Plant

*Data collected by Tidal Influence and AECOM, 2011

Non-Native Plant Species*

<i>Genus species</i>	Common Name
<i>Acacia pycnantha</i>	Golden Wattle
<i>Atriplex semibaccata</i>	Austrailian Salt Bush
<i>Bassia hyssopifolia</i>	Five-hook Bassia
<i>Brassica nigra</i>	Black Mustard
<i>Bromus diandrus</i>	Ripgut Brome
<i>Bromus madritensis</i>	Red Brome
<i>Capsella bursa-pastoris</i>	Sheperd's Purse
<i>Carpobrotus edulis</i>	Hottentot-fig
<i>Centaurea melitensis</i>	Tocalote
<i>Chenopodium album</i>	Lamb's Quarters
<i>Erigeron canadensis</i>	Canadien Horseweed
<i>Cortaderia selloana</i>	Pampas Grass
<i>Cotula coronopifolia</i>	Brass Buttons
<i>Cynodon dactylon</i>	Bermuda Grass
<i>Erodium cicutarium</i>	Common Stork's Bill
<i>Eucalyptus ficifolia</i>	Red Flowering Gum
<i>Eucalyptus globulus</i>	Blue Gum
<i>Pseudognaphallium luteoalbum</i>	Everlasting Cud Weed
<i>Hirschfeldia incana</i>	Shortpod Mustard
<i>Hordeum vulgare</i>	Common Barely
<i>Lactuca serriola</i>	Prickly Lettuce
<i>Limonium ramosissimum</i>	Algerian Sea-lavender
<i>Festuca perennis</i>	Italian Ryegrass
<i>Malephora crocea</i>	Coppery Iceplant
<i>Malva parviflora</i>	Cheeseweed
<i>Melilotus albus</i>	Honey Clover
<i>Melilotus indicus</i>	Sweet Clover
<i>Mesembryanthemum nodiflorum</i>	Slender-leaved Ice Plant
<i>Mesembryanthemum crystallinum</i>	Crystalline Ice Plant
<i>Myoporum laetum</i>	Ngao Tree
<i>Nicotiana glauca</i>	Tobacco Tree
<i>Olea europaea</i>	Olive Tree
<i>Parapholis incurva</i>	Sickle Grass
<i>Pennisetum setaceum</i>	Purple Fountain Grass
<i>Phoenix canariensis</i>	Canary Island Palm
<i>Helminthoteca echinoides</i>	Bristly Ox Tongue
<i>Polypogon monspeliensis</i>	Rabbit's Foot Grass
<i>Raphanus sativus</i>	Wild Radish
<i>Ricinus communis</i>	Castor Bean

Non-Native Plant Species*

<i>Genus species</i>	Common Name
<i>Salsola australis</i>	Russian Thistle
<i>Schinus terebinthifolius</i>	Brazilian Pepper Tree
<i>Silybum marianum</i>	Milk Thistle
<i>Sonchus oleraceus</i>	Sow Thistle
<i>Ulmus parvifolia</i>	Chinese Elm
<i>Urtica urens</i>	Annual Stinging Nettle
<i>Washingtonia robusta</i>	Mexican Fan Palm

*Data collected by Tidal Influence and AECOM, 2011