Appendix C
Biological Resources

ESA

Supplemental Biological Surveys and Mapping for the Los Cerritos Wetlands

Prepared by:

Coastal Restoration Consultants

772 Monte Vista Ave.
Ventura, CA 93003

Prepared for:

The Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Rd.
Azusa, CA 91702

ESA
626 Wilshire Blvd.
Los Angeles, CA 90017

April 2020

SECTION 1. INTRODUCTION

This report contains detailed information about some of the existing biological and jurisdictional resources within the Los Cerritos Wetlands (LCW) program area. The entire LCW complex includes some areas that were not mapped, specifically the Southern and Northern Synergy Oil Field Site properties and most of the Pumpkin Patch Site (Figure 1). Information was collected in order to supplement other studies, especially the Los Cerritos Wetlands Conceptual Restoration Plan (CRP). The scope of these supplemental efforts was focused on filling specific data gaps, updating and supplementing previous studies (Tidal Influence 2012, City of Long Beach 2017), and updating mapping to be more consistent with recent agency guidance.

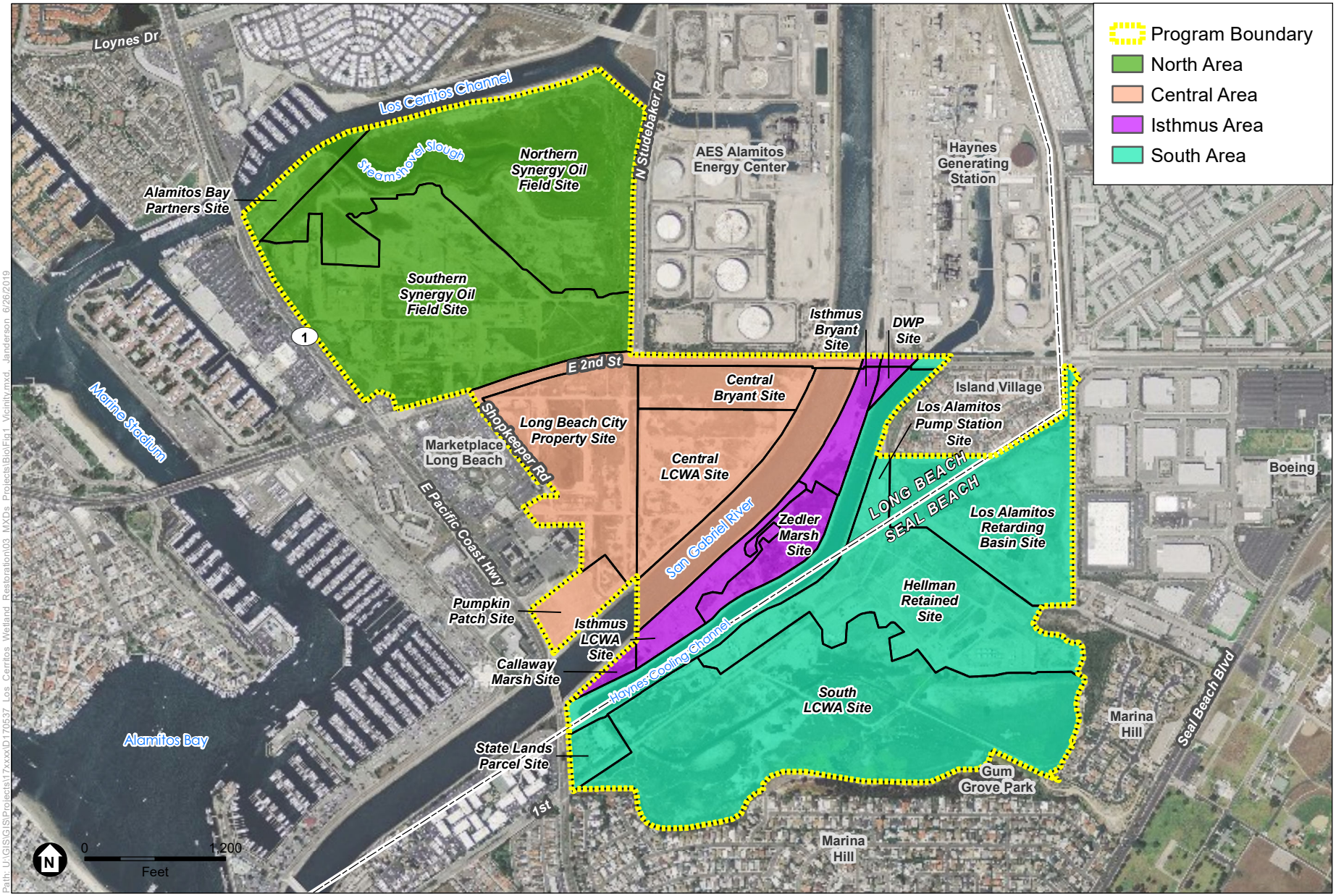
1.1 Methods

Large areas of the program area were accessible (Figure 2) and were surveyed on foot by CRC Principal Biologists Dave Hubbard and Matt James in Spring 2018 (Figure 3). Some of the inaccessible areas (Figure 2) were mapped using aerial photos, data contained in previous studies (*see* Tidal Influence 2012), and in limited cases, looking through fences. Mapping was done in the field using printed high-resolution aerial photos and hand-held GPS units.

The supplemental information in this report includes mapping of vegetation by community type along with other land cover types, likely jurisdictional wetlands and waters, California Coastal Commission (CCC) Environmentally Sensitive Habitat Areas (ESHA), and distributions of a few special status annual plants. Opportunistic observations of birds allowed for the expansion of the species list for the sites as well. The mapping of likely jurisdictional wetlands and waters was based primarily on vegetation patterns and observations of hydrologic indicators in the field. A formal jurisdictional delineation was not completed (one will be needed later in the planning process), but rather an attempt to estimate likely jurisdictional areas and acreages to assist in the restoration planning and environmental review process. The ESHA mapping includes areas that are likely jurisdictional and areas that were determined to support special status species. More details on methods as they relate to the different surveys and mapping efforts can be found in the introductory material for those sections below.

1.2 Summary of findings

The following overview provides general descriptions of the four geographic areas of the program area and general results of the field studies, especially in how they pertain to developing restoration priorities and actions. This should provide context and background for readers unfamiliar with the program area. This summary includes rough acreages for various mapping activities; the following sections should be consulted for more detailed and complete data. The remaining sections of this report also provide detailed methods and discussions of the field studies and are written to more directly support environmental review and permitting.



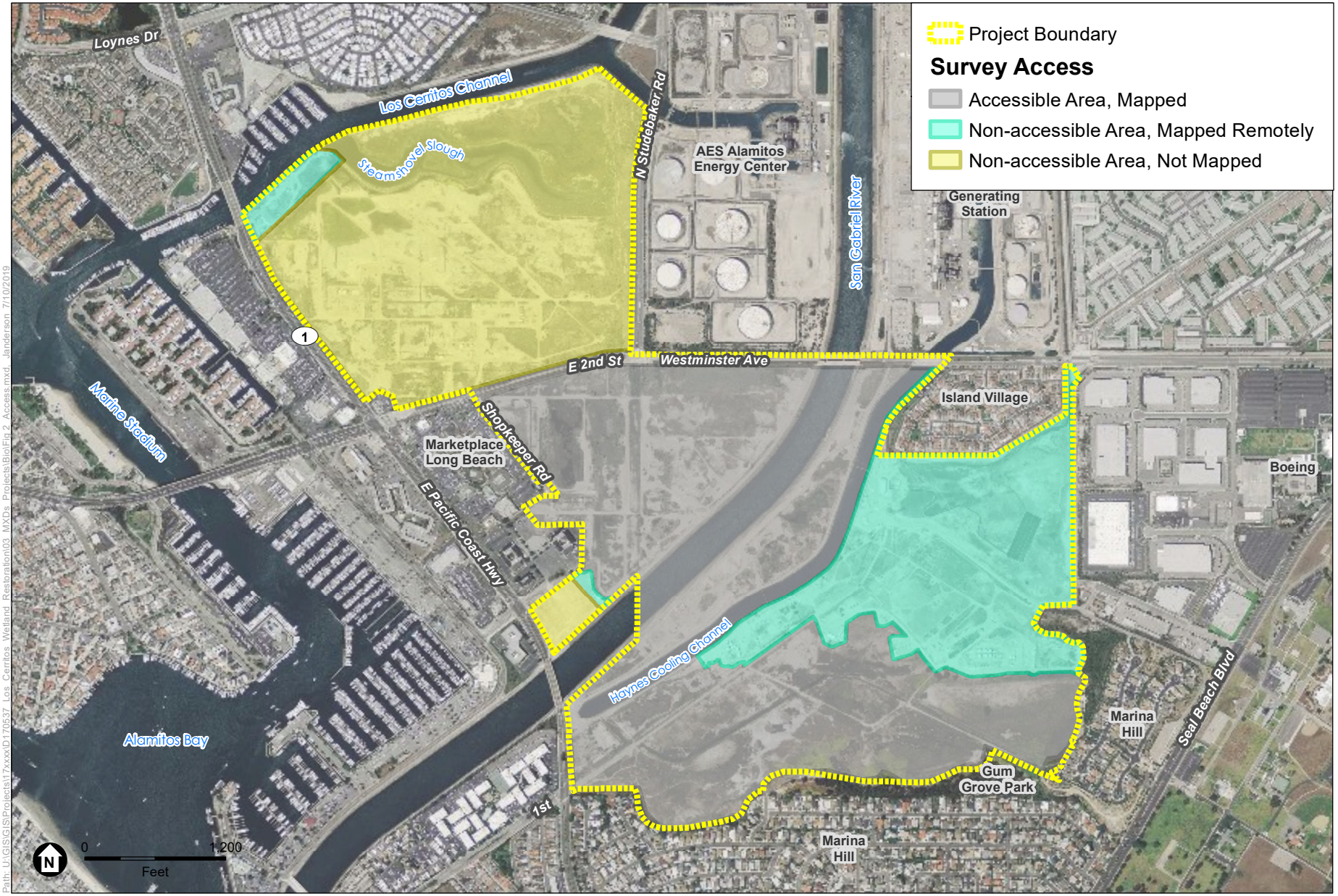
SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 1

Project Site and Local Vicinity

ESA



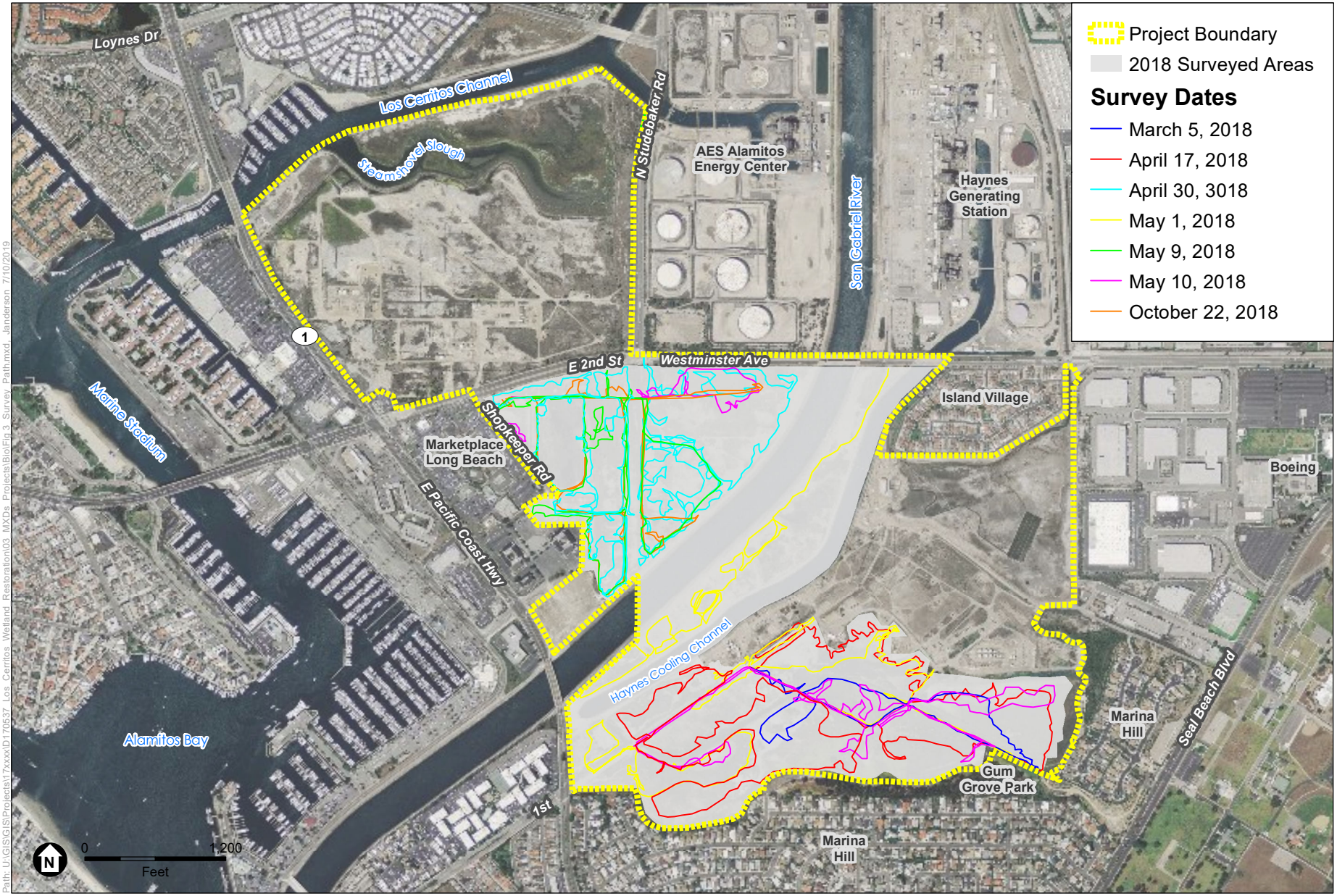
SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 2

Field Mapping Survey Access

ESA



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 3

Field Mapping Survey Paths

ESA

For planning purposes, the program area is divided into Southern, Central and Isthmus areas consistent with the rest of the Program Environmental Impact Report (PEIR) (Figure 1). In addition, there is a short description of a parcel in the northern area of the site (North), Los Alamitos Bay Partners, which was not surveyed on the ground by CRC, for which data was obtained remotely. The program area has a long and complicated land use history. Readers are referred to the CRP (Moffat and Nichol 2015) for descriptions of land ownership and land use practices within these different areas.

South Area

The South area extends over about 207 acres, approximately 93 of which are mostly unvegetated due to development or regular mowing and disking. Vegetated areas are mostly weedy uplands (57 acres) or tidal and non-tidal pickleweed (*Salicornia pacifica)* wetland (20 acres). Weedy upland areas are generally dominated by non-native invasive plant species (mustards, grasses, ice plants, and in some areas, weedy species tolerant of salty soils). Likely jurisdictional wetlands and waters and potential Environmentally Sensitive Habitat Areas (ESHA) cover about 25% of the South area (about 54 and 60 acres respectively), though more of these types of areas may occur in areas that were not surveyed (Figure 2).

The South area supports the largest expanse of tidally influenced wetlands within the surveyed areas. Tidewater enters the site via a culvert from the San Gabriel River and flows through tidal channels and inundates mud flat, salt marsh and salt flat habitats. The intertidal areas support a wide range of native salt marsh plants, invertebrates, birds and a breeding population of the state-endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Potential for wetland restoration is very high in the South area. About 70% of the area is heavily disturbed or developed upland (70 acres), managed for fuel breaks (23 acres), or weedy upland (57 acres). There are opportunities for: 1) improving hydrology by removing impediments to tidal flow in order to increase the tide range, 2) removing fill (including contaminated soil) to increase the area of tidal influence, 3) ecological restoration to increase native plant cover and habitat values for fish, invertebrates, and wildlife (especially birds), 4) converting low ecological functioning uplands to high-functioning wetlands, 5) restoring transition and upland habitats adjacent to tidal wetlands, and 6) building in long-term adaptation to sea level rise (because of the presence of large relief slopes at the site).

Isthmus Area

The Isthmus area is long and narrow with a relatively small total area (about 27 acres). It is highly constrained by complex ownership, flood control structures (the San Gabriel River levee), and other human-made features including the Haynes Cooling Channel, roadways, oil operations, and fuel breaks around oil operations (Figure 1). About one third of the Isthmus (9 acres) is developed (roads and oil operations). The vegetated portions of the site are somewhat fragmented and include mainly restoration/mitigation areas (6.1 acres), pickleweed marsh (4.8 acres), and weedy upland dominated by five-horn smotherweed (*Bassia hyssopifolia)* (1.9 acres). Other intertidal habitats occur adjacent to the pickleweed marsh and are supported by limited tidal flows delivered via culverts from the San Gabriel River. There are about 11 acres of likely wetlands and waters and almost 18 acres of potential ESHA in the Isthmus area. The rare annual

species southern tarplant (*Centromadia parryi* ssp. *australis*) is prevalent throughout the Isthmus area.

Potential for wetland restoration is good due to the presence of soils that would likely support wetlands with minor grading and hydrologic improvements, but acreage and landscape diversity is limited compared to other areas within LCW complex. There are opportunities for: 1) improving hydrology (removal of impediments to tidal flow and fuller tide range), 2) increasing native plant cover, fish and invertebrate habitat, and bird foraging area through increased tidal action, 3) decreasing cover of weedy plants by increasing inundation and salinity to favor natives, 4) improving transition and upland habitats adjacent to tidal wetlands (restoration is already in progress).

Central Area

The Central area is a relatively large area (about 95 acres) with a low relief landscape divided into shallow basins by roads, berms and pipeline corridors. Oil extraction infrastructure and fuel breaks limit the amount of vegetation to about 19 acres of the Central area. The most widespread vegetation types on site are wetlands dominated by pickleweed (27 acres) and salt grass (*Distichlis spicata*) (10 acres) and uplands dominated by non-native annual grasses (4 acres). The wetland communities are probably relatively high in salinity but are non-tidal. They are mostly supported by rainfall and perhaps a shallow watertable. A brackish marsh on site dominated by California bulrush (*Schoenoplectus californicus*) and cattail (*Typha* spp.) is fed by runoff from adjacent properties and covers about four acres.

The Central area supports about 69 acres of likely wetlands and waters and potential ESHA (73% of the area). The existing brackish marsh at the northwestern portion of the area provides habitat and nesting areas for many bird species. Seasonal (non-tidal) wetlands in the topographic basins currently support shorebirds, waterfowl, herons, and egrets in good rain years. A very small area at the south end of the site receives high tide flows of seawater during spring tides. Non-tidal pickleweed habitat provides many wetland functions, but it is not usually ideal for nesting Belding's savannah sparrow and we did not observe them during our fieldwork in the area.

Potential for wetland restoration is very high in the Central area despite the existing high ratio of wetlands, waters and ESHA to weedy uplands and developed areas. Restoration actions could substantially improve the functioning of existing sensitive areas in the Central area. There are opportunities for: 1) improving hydrology (*e.g.,* introduction of tidal flow to large portions of the site, increasing the area of seasonal wetlands, or managed hydrology), 2) increasing native plant cover and fish, invertebrate, and bird habitat through increased tidal action or seasonal ponding, 3) converting low functioning uplands to wetlands through removal of fill and hydrologic improvements, and 4) restoring transition and upland habitats adjacent to tidal wetlands that can also provide resilience as sea level rises.

North Area

The assessment of the North area was limited to one small parcel (about six acres) that was not accessible during fieldwork. Interpretation of aerial photographs suggested that vegetation was composed mostly of weedy non-native annual species like five-horn smotherweed (1.6 acres) with some pickleweed (one acre) and non-native ornamental plants (0.3 acres). About 2.2 acres of the parcel were developed. No jurisdictional or ESHA assessment was performed for this site, but based on vegetation patterns it seems likely that areas supporting pickleweed, five-

horn smotherweed (both potential wetland indicators), or showing signs of occasional flooding might be considered to be jurisdictional and/or ESHA.

Potential for wetland restoration in this small portion of the North area is moderate, but acreage and landscape diversity are limited at this site. There are opportunities for: 1) improving hydrology (*e.g.*, removal of impediments to tidal flow), 2) increasing native plant cover and enhancing fish, invertebrate, and bird habitat through increased tidal action, and 3) decreasing cover of weedy plants by increasing inundation and salinity to favor natives. Hydrologic and ecological connectivity to adjacent sites may be important considerations as the site lies between tidal waters and low-lying non-tidal areas.

SECTION 2. VEGETATION ALLIANCES AND LAND COVER TYPES

This section lists the categories used for mapping vegetation and other land cover types within parts of the LCW program area. CRC biologists conducted mapping of vegetation associations and other land cover types in accessible parts of the program area (Figure 3) in spring 2018. The information on the dominant vegetation and other cover classes was used in assessing wetland and ESHA status.

The mapped area is a complicated mosaic with multiple parcels divided by channelized tidal waterways and roads. It supports oil production, open space, and related land management and restoration activities. Overall, the mapped area includes more than 50 acres of open water, 78 acres likely to be considered as wetland by at least some agencies plus 12 acres of tidal salt marsh and salt flats, 8 acres of upland with native species dominant, 68 acres of weedy upland habitat, 17 acres under restoration, and 37 acres of disturbed or managed upland. Figure 4 presents the final mapping and Table 1 presents the total acreages for each mapping category.

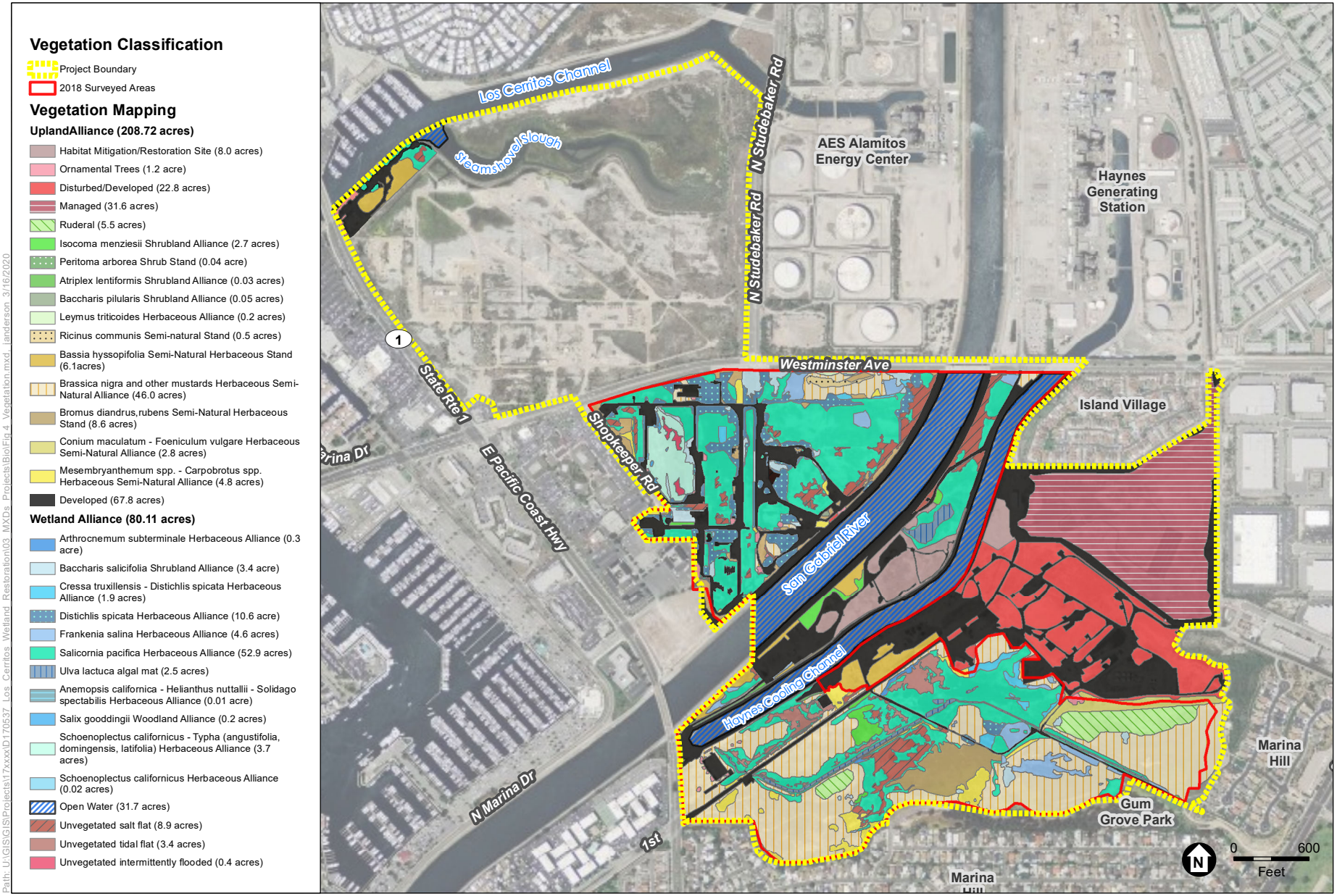
Each of the vegetation and land cover types are shown in Figure 4 along with the corresponding area in acres. There are short descriptions of the cover classes below. CRC has used three types of cover classes: vegetation alliances, vegetation stands and other land cover types.

Vegetation Alliances. Most of the vegetated cover classes are alliances from the Manual of California Vegetation (MCV), where an alliance is defined as a category of vegetation classification, which describes repeating patterns of plants across a landscape. Each alliance is defined by plant species composition, and reflects the effects of local climate, soil, water, disturbance, and other environmental factors (Sawyer et al 2009).

Vegetation Stands. Some of the vegetated cover classes use terminology including the word stand. These are consistent with MCV methods but include novel plant assemblages not described in the MCV. Where possible, CRC has used stand categories previously used in mapping areas of the LCW (City of Long Beach 2017).

Other land cover types. For unvegetated cover types and for restoration sites, CRC mapped using descriptions based on management, disturbance and hydrology.

Natural Communities considered by the California Department of Fish and Wildlife to be sensitive are marked with an asterisk (*) below (*see* CDFW 2018). Land cover types that we considered as potentially occurring in jurisdictional areas are marked with a pound sign (#) below (*see* Section 3). See Appendix 2 of this report for representative photos of many of the different alliances and stands.



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 4

Vegetation Mapping 2018

ESA

Table 1. Acreages by mapping class for the program area

MAPPING CLASS	Grand Total
NATIVE WETLAND CLASSES	
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis Herbaceous Alliance	0.01
Arthrocnemum subterminale Herbaceous Alliance	0.32
Baccharis salicifolia Shrubland Alliance	3.33
Cressa truxillensis - Distichlis spicata Herbaceous Alliance	1.87
Distichlis spicata Herbaceous Alliance	10.58
Frankenia salina Herbaceous Alliance	4.61
Salicornia pacifica Herbaceous Alliance	52.89
Salix gooddingii Woodland Alliance	0.22
Schoenoplectus californicus - Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance	3.71
Schoenoplectus californicus Herbaceous Alliance	0.02
Ulva lactuca algal mat	2.55
NATIVE UPLAND CLASSES	
Atriplex lentiformis Shrubland Alliance	0.03
Baccharis pilularis Shrubland Alliance	0.05
Isocoma menziesii Shrubland Alliance	2.66
Peritoma arborea shrub stand	0.04
Leymus triticoides Herbaceous Alliance	0.18
NON-NATIVE CLASSES	
Bassia hyssopifolia Semi-Natural Herbaceous Stand	6.13
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance	45.59
Bromus diandrus,rubens Semi-Natural Herbaceous Stand	8.68
Conium maculatum - Foeniculum vulgare Herbaceous Semi-Natural Alliance	2.79
Mesembryanthemum spp. - *Carpobrotus* spp. Herbaceous Semi-Natural Alliance	0.9
Ricinus communis Semi-natural Stand	0.49
OTHER CLASSES	
Open Water	31.72
Active Habitat Mitigation/Restoration Site (non-wetland)	8.02
Disturbed - mowed/disked fire break	30.27
Managed	31.60
Ornamental	1.19
Ruderal	5.49
Unvegetated salt flat	8.71
Unvegetated tidal flat	3.80
NON NATURAL AREAS	
Developed	68.20

2.1 Cover Class Descriptions

***Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* Herbaceous Alliance*#.** Yerba mansa (*Anemopsis californica*) occurs in low-salinity soils that are moist more or less year-round, possibly associated with seeps or urban runoff. Yerba mansa occurs as a nearly-monotypic stand.

***Arthrocnemum subterminale* Herbaceous Alliance*#**. Parish's glasswort (*Arthrocnemum subterminale*) is a plant that is most common in high marsh areas with seasonally hypersaline soils. This species often forms monocultures. Other species that are sometimes associated with it include common pickleweed, alkali heath (*Frankenia salina*), salt grass, shore grass (*Distichlis littoralis*), and sea lavender (*Limonium californicum*).

***Atriplex lentiformis* Shrubland Alliance**. Quailbush (*Atriplex lentiformis*) is a large evergreen shrub and is dominant in the shrub canopy. The canopy is open to intermittent, and the herbaceous layer is variable. Stands occur on heavy salt-affected soils that may be upland, transition, or wetlands. The understory in these areas typically consists of non-native grasses and forbs.

***Baccharis pilularis* Shrubland Alliance**. Coyote brush (*Baccharis pilularis*) is a large drought-tolerant evergreen shrub that tolerates seasonally waterlogged soils. A few small, scattered patches of the vegetation type occur in upland areas. The patches are dominated by coyote brush and the understory typically consists of non-native grasses and forbs.

***Baccharis salicifolia* Shrubland Alliance#**. Mulefat (*Baccharis salicifolia*) is a large evergreen shrub that occurs along creeks and rivers, in and adjacent to freshwater wetlands, and in uplands. Most of the mulefat at the site occurs in small to medium patches, often in areas that receive runoff from developed areas. This alliance consists of generally small thickets of mulefat with understory that varies from location to location but may include one or more of the following species: salt grass, seaside heliotrope (*Heliotropum curassivicum*), small-flowered ice plant (*Mesembryanthemum nodiflorum*), five-horn smotherweed , and non-native upland grasses.

***Bassia hyssopifolia* Semi-Natural Herbaceous Stand#**. Five-horn smotherweed is a non-native annual species that occurs on disturbed, often saline, soils. In the program area, stands occur in areas that are probably seasonally mowed and consist of locally dense thickets, typically adjacent to oil operations. This species is also a common weed as understory in other associations. [The MCV II does not have a description for this alliance, it was used here for consistency with City of Long Beach (2017) mapping.]

***Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.** This alliance includes herbaceous vegetation dominated by various nonnative mustards, mostly annual and biennial species, including black mustard (*Brassica nigra*), summer mustard (*Hirschfeldia incana*), or wild radish (*Raphanus sativus*). Most of these species are invasive exotics. Native shrubs may be present but only at low relative and absolute cover. The nonnative herbs clearly dominate the landscape. This alliance occurs primarily on soils with a history or disturbance.

***Bromus diandrus, rubens* Semi-Natural Herbaceous Stand**. Non-native annual upland grasses in the genera *Bromus* (bromes) and *Avena* (wild oats) dominate these areas. They are typically upland areas that have a history of soil disturbance. Dominant species include red brome (*Bromus madritensis*), rip gut brome (*Bromus diandrus*), slender wild oats (*Avena barbata*), smilo grass (*Stipa miliacea*), as well as locally dense patches of non-native forbs including small-flowered ice plant, five-horn smotherweed, Australian saltbush (*Atriplex semibaccata*), tocalote (*Centaurea melitensis*), London rocket (*Sisymbrium irio*), and summer mustard. [Note that two categories of MCV II "brome grasslands" have been combined for simplification.]

***Conium maculatum* - *Foeniculum vulgare* Herbaceous Semi-Natural Alliance**. Poison hemlock (*Conium maculatum*) is a biannual invasive exotic species that is dominant (or co-dominant with other non-native plants) in the herbaceous layer. This alliance occurs in uplands on disturbed soil. Other species include a wide variety of annual non-native grasses and annual mustards (*Brassica* spp.).

***Cressa truxillensis* - *Distichlis spicata* Herbaceous Alliance*#**. Alkali weed (*Cressa truxillensis*) is a native perennial herbaceous plant that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. Other species that co-occur with alkali weed at the site include salt grass, non-native annual grasses, and alkali heath.

Developed. This class includes buildings, concrete pads, infrastructure, roads, sidewalks, parking areas, other pavement, constructed drainage and erosion control structures, barriers, berms, sumps and levees.

***Distichlis spicata* Herbaceous Alliance*#**. Salt grass is a perennial rhizomatous grass that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. Salt grass is common in a variety of alliances throughout the site, though it dominates in these areas. Other species commonly associated with this alliance include common pickleweed, alkali heath, non-native annual grasses, alkali weed, small-flowered ice plant, and five-horn smotherweed.

Disturbed - mowed/disked firebreak. These areas are associated with areas disturbed by current oil operations where vegetation is managed by regular disking or mowing. Most of these areas are bare soil or are sparsely vegetated. Vegetation, where it is associated with these areas, is essentially all non-native with species such as small flowered ice plant, five-horn smotherweed and non-native grasses being most common.

***Frankenia salina* Herbaceous Alliance*#**. Alkali heath is a low-growing, woody, rhizomatous halophyte that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. It is common in a variety of alliances at the site but occasionally forms unbroken stands that constitute a separate alliance. Other species commonly found in this alliance include salt grass, common pickleweed, alkali weed, and non-native annual grasses.

Habitat Mitigation/Restoration site. These areas are the subject of ongoing management as restoration or mitigation sites. The vegetation includes various upland and wetland herbs, shrubs and trees. Non-native species are being managed by weeding. Irrigation may be ongoing.

Isocoma menziesii* Shrubland Alliance. Menzie's goldenbush (*Isocoma menziesii)* is an upland shrub that is found in transition zone habitats around salt marshes, on coastal bluffs, and in coastal sage scrub. It is tolerant of occasional flooding and tolerates higher salinity than most upland shrubs. It is a good colonist on disturbed soils, and is often found with a non-native understory that includes small-flowered ice plant and non-native grasses.

***Peritoma arborea* shrub stand**. Bladderpod (*Peritoma arborea*) is a native woody shrub that is growing with non-native mustards and annual grasses on disturbed upland soils.

***Leymus cinereus* - *Leymus triticoides* Herbaceous Alliance*#.** Alkali rye grass (*Leymus triticoides*) is a rhizomatous perennial grass that typically occurs on saline or alkaline soils with a shallow water table. It forms nearly monotypic stands.

Managed. These areas are the subject of ongoing management as part of the operation of the Los Alamitos Retarding Basin. The vegetation includes various upland and wetland herbs and shrubs.

***Mesembryanthemum* spp. - *Carpobrotus* spp. Herbaceous Semi-Natural Alliance**. Non-native annual iceplant species (*Mesembryanthemum* spp.*)* occur in wetland and upland areas typically on disturbed, saline soils. Perennial iceplant species (*Carpobrotus* spp.) form large mats in uplands in the South area. Where this alliance is dominated by small-flowered ice plant and/or crystalline ice plant (*Mesembryanthemum crystallinum*) other species are very sparse or absent. Where sea fig (*Carpobrotus edulis)* is the dominant, it co-occurs with annual grasses.

Open Water#. These areas are permanently flooded tidal areas. They may support patches of rooted eelgrass (*Zostera spp.),* however this species was not mapped in this effort.

Ornamental Tree. The site supports scattered areas of non-native invasive trees. The diversity of non-native trees scattered across the site is substantially higher than captured by any MCV II alliance so these trees were mapped as "Ornamental Trees". These include a range of non-native trees, including Myoporum (*Myoporum laetum*), Canary Island Palm (*Phoenix canariensis*), Mexican Fan Palm (*Washingtonia robusta*), Shamel Ash (*Fraxinus uhdei*), Bluegum Eucalyptus (*Eucalyptus globulus*), Sydney golden wattle (*Acacia longifolia*), and Brazilian pepper (*Schinus terebinthifolius*). Some of these have various annual non-natives as understory species.

***Ricinus communis* Semi-natural Stand.** Castor bean (*Ricinus communis*) is a large invasive non-native woody shrub that occurs primarily on disturbed upland soils. It grows with tree tobacco (*Nicotiana glauca*) and non-native annual grasses (*Avena* and *Bromus* spp.).

Ruderal. Ruderal areas are dominated by telegraph weed (*Heterotheca grandiflora*) is a native annual or short-lived perennial herbaceous species that grows on disturbed upland soils. It grows on site in low densities on sandy soils (likely dredge material as mollusk shells characteristic of salt marsh and beach habitats are common on the soil surface). It grows with scattered annual grasses, heron's bill (*Erodium* spp.) and Lewis' evening primrose (*Camissoniopsis lewisii*).

***Salix gooddingii* Woodland Alliance*#**. Black willow (*Salix gooddingii*) is a native tree found along streams and rivers and in wetlands. It occurs along some edges of Marketplace Marsh. The understory varies but typically included natives like salt grass, tall nut sedge (*Cyperus eragrostis*), and seaside heliotrope, or with non-natives such as curly dock (*Rumex crispus*).

***Salicornia pacifica* Herbaceous Alliance*#**. Common pickleweed is a herbaceous perennial native wetland species that occurs in tidal salt marshes and salt-affected seasonal wetlands. It is the most common wetland alliance in the program area. Other common species that co-occur with common pickleweed include alkali heath, Parish's glasswort, salt grass, sea lavender, and alkali weed.

***Schoenoplectus californicus - Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance*#.** California bulrush grows with cattails in seasonally flooded or saturated brackish or freshwater wetlands. It grows with trees such as black willow and herbaceous species such as curly dock in basins that are augmented by artificial dry season inflows.

***Schoenoplectus californicus* Herbaceous Alliance#.** California bulrush is a large perennial grass like herb that occurs along freshwater water sources in wetlands. This alliance occurs in a small patch, in an area that receives runoff from developed areas. This alliance consists of generally small, monotypic thickets of California bulrush with little to no understory or other dominant species.

***Ulva lactuca* algal mat#.** Sea lettuce (*Ulva lactuca*) is a green seaweed that occurs in mid to low intertidal areas and tide pools. This cover class represents areas of low elevation mudflat and tidal channel that have moderate to high cover of algal mats. The mats may occur seasonally or intermittently and may be associated with poor water quality (*i.e.*, high nutrient loads).

Unvegetated salt flat#. This habitat type occurs in non- tidal areas that do not have vegetation. The lack of vegetation is likely due to hypersalinity of soils. High soil salinity may be from very rare or historic tidal inundation or as a legacy (*i.e.*, soil dredged from tidal or sub-tidal habitats and placed on site).

Unvegetated tidal flat#. This habitat type occurs in tidal areas that do not have emergent vegetation. The lack of vegetation may be due to more or less constant ponding of water (shallow depressions on the marsh plain). They may support algal mats seasonally though they were not observed during out mapping.

SECTION 3. WETLAND ASSESSMENT

CRC conducted an analysis to identify and map potential waters and wetlands that are likely to be considered jurisdictional by the US Army Corp of Engineers (Corp) (non-wetland waters of the US and wetland waters of the US), State Water Resources Control Board (SWRCB) (non-wetland waters of the State and wetland waters of the State), and the California Coastal Commission (CCC) (CCC wetlands and CCC jurisdiction) within the program area. The California Department of Fish and Wildlife (CDFW) may take jurisdiction of some areas but we did not attempt to map it in this effort. In very general terms, CDFW takes jurisdiction over rivers, creeks, and other waterways and riparian habitat. The San Gabriel River (SGR) and other channels in the program area are salt water tidal as opposed to traditional waterways that CDFW typically takes jurisdiction over. Willow trees in Marketplace Marsh may be considered riparian habitat, but they are located in a stormwater-fed basin, not along a traditional water way. As part of a future wetland delineation, CDFW, the Corp, SWRCB, and CCC should all be consulted to determine the extent to which they will take jurisdiction over different areas within the program area.

This wetland assessment is meant to help guide the development of restoration and public access alternatives for the program and is not sufficient for permitting or other regulatory use. This is not a jurisdictional delineation. The jurisdictional classifications we used (below) are largely based on the vegetation mapping done in 2018 (*see* Section 2). Certain vegetation alliances and stands and unvegetated habitats were assumed to be strongly associated with jurisdictional areas (see Section 2 of this report for the list). We also considered whether or not the wetland-associated habitats had sufficient wetland plant cover to meet jurisdictional standards, or in some cases might be considered "problematic" per Corp guidance (*e.g.*, areas such as salt flats that do not meet Corp criteria for vegetation but that they may consider wetlands anyway). We assessed all areas for signs of hydrology in the field and in aerial photos. Soils were not analyzed.

The minimum mapping unit was approximately one-tenth of an acre; smaller scale variation exists throughout the program area that was not mapped. Our analysis (Figure 5) shows that a large proportion of the site (Table 2) is likely federal and/or state wetland or waters. We identified five different potential types of jurisdictional areas on site along with four other types of areas that are likely not jurisdictional:

Probable Non-wetland Waters of the US/State and CCC Jurisdiction – these include areas that the Corp would likely consider Waters of the US, the SWRCB would consider Waters of the State, and CCC might take jurisdiction of. These are predominantly unvegetated salt water tidal channels in the program area.

Probable Intertidal Jurisdiction of the US, State and CCC – generally rocky intertidal areas that are neither waters nor wetlands but would likely fall under the jurisdiction of the Corp, SWRCB, and CCC.

Probable Wetland Waters of the US/State and CCC Wetland – these include all areas that likely meet the three-parameter wetland criteria of the Corp (hydrology, vegetation, and soil). In meeting the criteria for the Corp, they would also meet wetland criteria for SWRCB and CCC.

Potential Wetland Waters of the US/State and Probable CCC Wetland – these are areas that have obvious indications of at least one of the three Corp wetland indicators but may not have all three. In general, they were dominated by wetland-indicator plants, but lacked obvious hydrology. CCC would very likely consider these wetlands as they meet the so-called "one-parameter test."

Potential CCC Wetland – these are areas that may have at least one wetland indicator but obviously lack at least one. CCC might consider these wetlands as they might meet the so-called "one-parameter test."

Habitat Mitigation/Restoration Site – these are areas under active or very recent management (some combination of irrigation, planting, weeding, etc.) as of 2018; some may be jurisdictional now or in the future, but they were not analyzed.

Not Assessed - Potentially Jurisdictional – These include areas that were not accessible during our field work but based on aerial photography, might be jurisdictional.

Developed– these are areas that are actively used as roads (paved or dirt) or for commercial uses (some of the dirt areas may be considered ESHA by CCC due to the presence of sensitive plant species but were not classified as potential CCC wetland because they did not appear to meet any of the three wetland criteria).

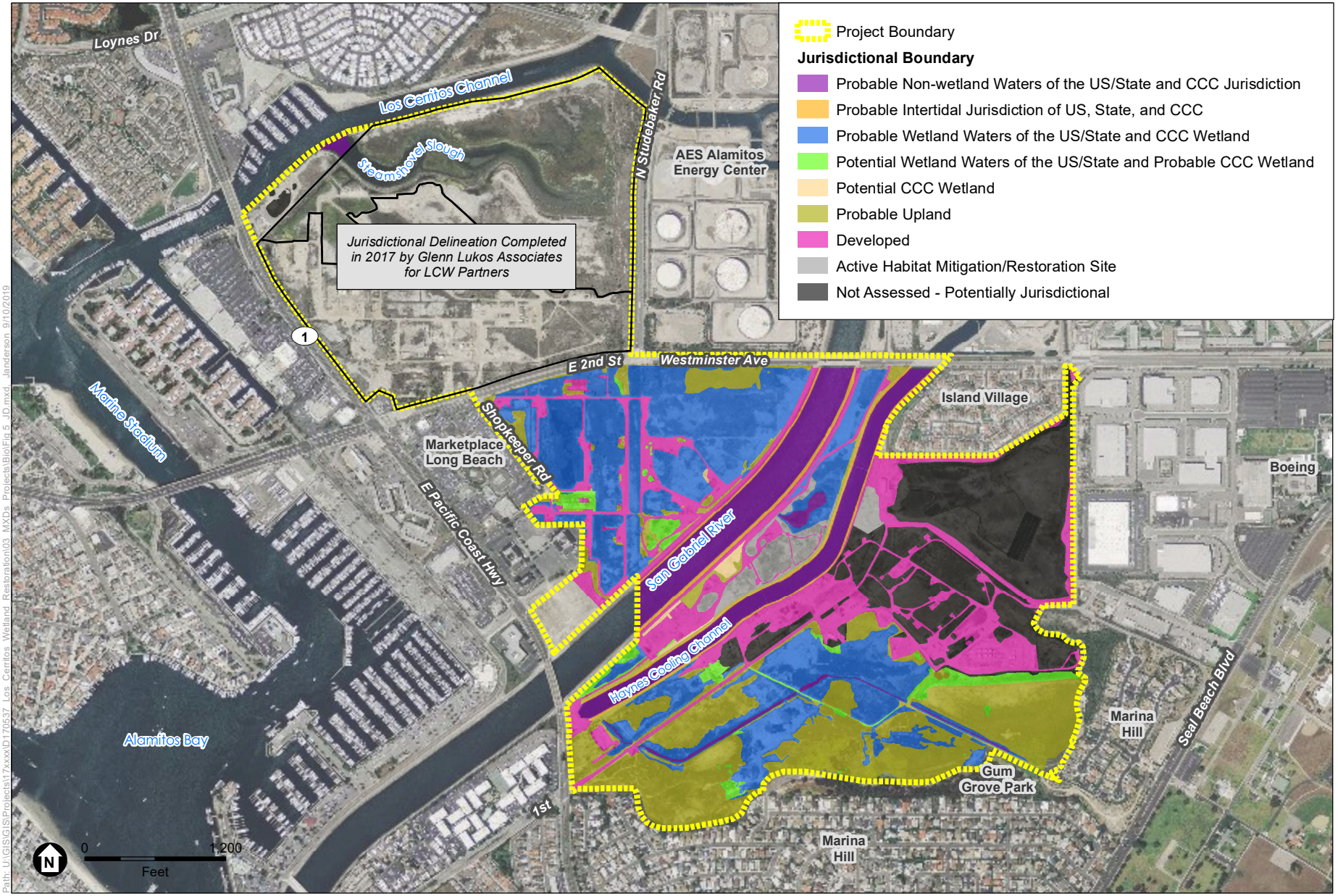
Probable Upland – areas that probably will not qualify as wetlands or waters (though some of these area are likely to be considered ESHA by CCC due to the presence of sensitive plant species and/or communities).

A large portion of the program area (at least 134 acres) will likely fall under state and/or federal jurisdiction. During the development of restoration alternatives, it will be important to consider approaches that are at least self-mitigating to the extent that different types of jurisdictional areas might be altered. This analysis may also be useful in the development of public access alternatives to the extent that trails and other features might impact jurisdictional areas.

The mapping scheme employed in this study does not allow for spatial overlap between different classes (*i.e.,* any point on the map falls in exactly one category).

Table 2. Results of jurisdictional mapping (acres)

Jurisdictional Assessment Class	Central	Isthmus	North	South	Total
Probable Non-wetland Waters of the US/State and CCC Jurisdiction	17.15	1.00	0.73	15.04	33.91
Probable Intertidal Jurisdiction of the US, State and CCC	1.61	0.04		1.58	3.23
Probable Wetland Waters of the US/State and CCC Wetland	48.44	7.18		31.78	87.40
Potential Wetland Waters of the US/State and Probable CCC Wetland	2.44	1.00		5.10	8.54
Potential CCC Wetland	0.08	1.04		0.16	1.28
Active Habitat Mitigation/Restoration Site		6.45		1.76	8.21
Not Assessed - Potentially Jurisdictional			0.72	57.07	57.79
Developed	16.36	8.62	2.30	33.48	60.77
Probable Upland	8.17	1.62	0.38	60.58	70.74



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 5
Jurisdictional Boundaries

ESA

SECTION 4. ENVIRONMENTALLY SENSITIVE HABITAT AREAS ASSESSMENT

This section summarizes methods and results for the mapping of potential CCC ESHA within parts of the LCW complex. Potential ESHA was mapped in the Isthmus, South, and Central Areas and on the Los Alamitos Bay Partners site in the North area only. The assessment is based on fieldwork performed by CRC in spring 2018 to map vegetation, rare plants, and wetlands and waters, as well as being informed by previous studies (Tidal Influence 2012).

The mapping was done following CCC guidance. The CCC defines ESHA as:

> *"Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments*".

The CCC (Dixon 2003) has identified three primary elements to the definition of ESHA. First, there must be a geographic area that can be designated ESHA either because of the presence of individual species of plants or animals or because of the presence of a particular habitat. Second, in order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable. Finally, the area must be easily disturbed or degraded by human activities.

The first test of ESHA is whether a habitat or species is rare. Under CCC guidance, rarity can take several forms. Many rare species or habitats are globally rare, but locally abundant. They have suffered severe historical declines in overall abundance and currently are reduced to a small fraction of their original range, but where present may occur in relatively large numbers or cover large local areas. Some other habitats are geographically widespread, but occur everywhere in low abundance. In the context of the LCW, salt marsh and other wetlands likely fall in either of these categories. Species listed as rare, threatened, or endangered by public agencies or the California Native Plant Society may fall in to either category as well. The LCW complex supports numerous such species in wetland and upland areas.

A second test for ESHA is whether a habitat or species is especially valuable. Areas may be valuable because of their "special nature," such as being an unusually pristine example of a habitat type, containing an unusual mix of species, supporting species at the edge of their range, or containing species with extreme variation. With the exception of Steamshovel Slough, most of the habitats in the LCW complex probably do not meet this test. However, habitats or species are considered valuable if they have a special "role in the ecosystem." For example, wetlands and some uplands in the LCW complex may meet this test because they provide habitat for rare, threatened, and endangered species, protect water quality, provide corridors linking sensitive habitats, or support important trophic connections to a wider ecosystem. The CCC has acknowledged that because all species play a role in their ecosystem, all are arguably "special." However, the Coastal Act requires that this role be "especially valuable." This test is likely met for the mapped areas within the LCW complex because they are demonstrably rare and have an extraordinarily special nature in the context of the massive loss of similar habitats in the region due to urbanization.

Finally, ESHAs are those areas that could be easily disturbed or degraded by human activities and developments. Within the LCW complex, as in most areas of southern California

affected by urbanization, all natural habitats are in grave danger of direct loss or significant degradation as a result of many factors related to anthropogenic changes. Limited areas within the LCW are at direct threat of development, however, degradation of existing habitats by alterations to hydrology and improvements to adjacent infrastructure (e.g., levees, roads, oil pipelines and wells, etc.) is an ongoing and significant risk.

Final ESHA determinations can only be made by the CCC. For planning purposes we have been conservative in this mapping of ESHA. Some of these areas may not ultimately meet the CCC test. For this analysis, all potentially jurisdictional wetlands and waters, areas with wetland plant communities, areas that support rare, threatened, or endangered plants and/or animals, and mitigation sites were all mapped as potential ESHA (Figure 6, Table 3). Mitigation sites were included as they all typically support, or will support in the near future, populations of the rare southern tarplant (*Centromadia parryi* ssp. *australis*). Potential ESHA in inaccessible parts of the South area were mapped but were not assessed on the ground (Figure 6). ESHA mapping in these areas is very tentative but follows logically from the mapping of potential wetlands and rare plants from previous studies (Tidal Influence 2012).

ESHA was recently mapped in the North Area in the LCW Oil Consolidation and Restoration Project EIR (City of Long Beach 2017). The mapping criteria for that effort were different than for this program. They mapped ESHA primarily based on the presence of a rare plant community or rare plants. Our approach used the above guidance (regional rarity of habitats, ecosystem services, etc.), which we believe is more in line with CCC policy. Our approach was to be conservative and include all potential areas. Our approach is more in line with a recent ESHA determination by the CCC at Banning Ranch in Newport Beach (Engel 2015), which we believe is a reasonable model for mapping ESHA at the LCW.

The CCC may consider a large portion of the site to be ESHA. As such, restoration actions that alter habitats and disturb ESHA will need to mitigate those impacts. Restored wetland, wetland-upland transition, grassland, and coastal sage scrub habitats for instance would likely be considered ESHA and contribute to mitigating impacts to existing ESHA. Flood control structures, roads, and paths would very likely not be considered ESHA. During the development of restoration alternatives, it will be important to consider approaches that are at least self-mitigating to the extent that ESHA's might be altered. This analysis may also be useful in the development of public access alternatives to the extent that trails and other features might impact ESHAs.

Table 3. Areas of potential ESHA by area (acres)

ESHA Classification	Central	Isthmus	North	South	Grand Total
Potential ESHA	69.09	17.71		59.99	146.79
Not Assessed - Potential ESHA			2.68	56.92	59.60
Totals	69.09	17.71	2.68	116.91	206.39

Path: U:\GIS\GIS\Projects\17xxxx\D170537_Los_Cerritos_Wetland_Restoration\03_MXDs_Projects\Bio\Fig 6_ESHA.mxd Janderson 7/10/2019

SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 6

California Coastal Commission Environmentally Sensitive Habitat Areas

ESA

SECTION 5. ASSESSMENT OF THREE SPECIAL STATUS SPECIES

This assessment of special status plant and animal species is based on limited fieldwork in the spring and fall 2018 and is meant to be a supplement to a thorough report produced as part of the CRP. The primary focus of this report is to update the mapping of known populations of three rare annual plant species. Annual plant species vary in their abundance and spatial distribution between years, primarily due to differences in the amount and timing of rainfall. This additional mapping effort was undertaken in order to provide a potentially more complete representation of where these species occur within the program area and to document potential new locations. CRC principles Matt James and David Hubbard, who both have extensive experience with the target species, carried out the searches and did the mapping. Properties not owned and/or managed by LCWA and their partners were not searched.

5.1 Methods

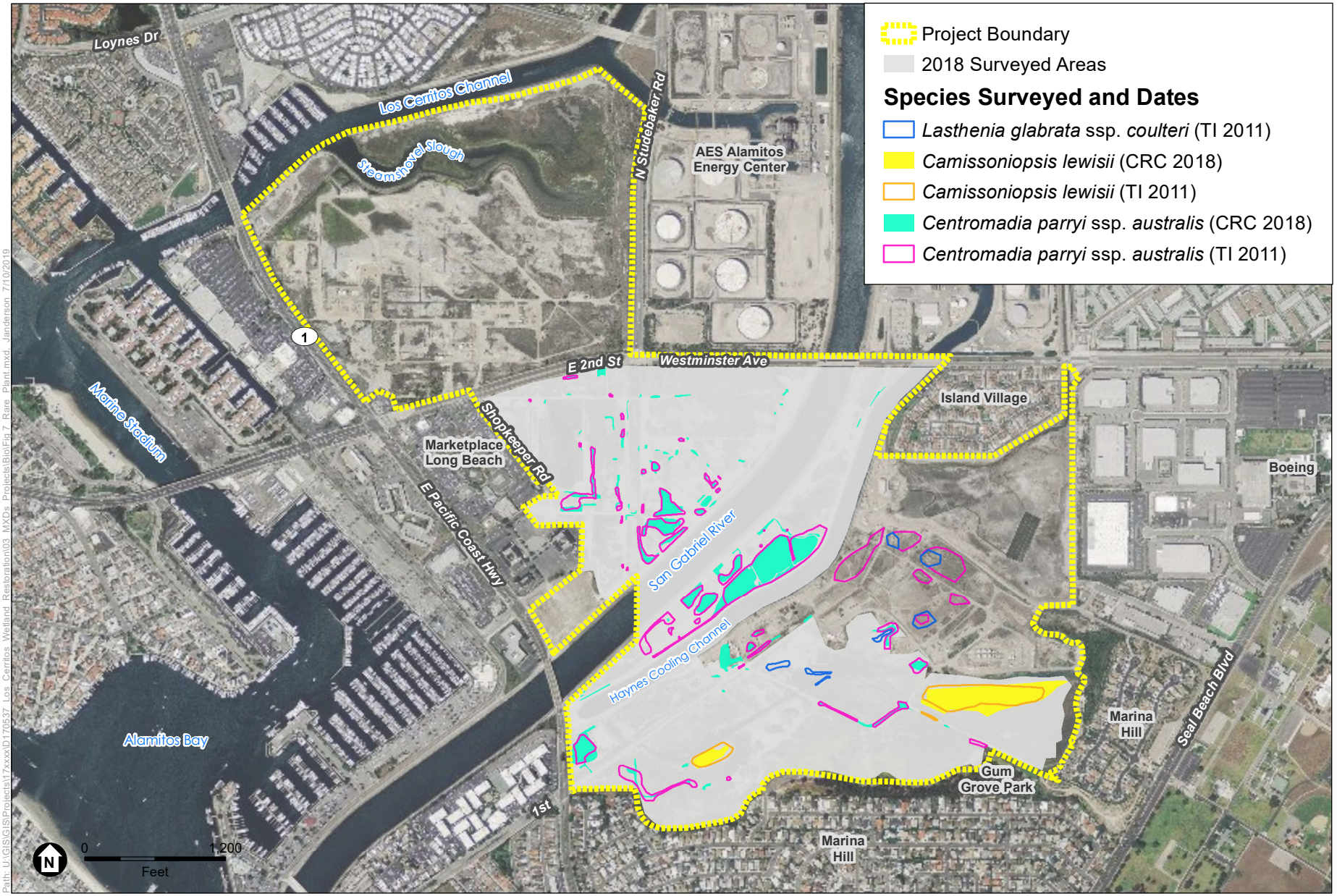
Rare plant mapping efforts focused on three annual plant species, southern tarplant (*Centromadia parryi* ssp. *australis*), Lewis' evening primrose (*Camissoniopsis lewisii*), and Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*). All three species are known to occur within the program area (Tidal Influence 2012) but their abundance and distribution vary between years depending mainly on rainfall timing and amount. Rainfall measured at a nearby weather station in Long Beach averages 11.32 inches (288 mm) per year. In the 2017-18 rainfall season, only 3.65 inches (93 mm) of rain fell. Lack of rain greatly limited germination and establishment of annual plants. In the 2016-17 rainfall season, 19.98 inches (507 mm) of rain fell, resulting in abundant germination and establishment of annual plants. We were able to identify the dead remains of the target plant species that germinated and established in this above-average rainfall year. Plants from both years were mapped but not distinguished as dead or alive.

Rare plant surveys were carried out during vegetation mapping efforts throughout the accessible areas of the program (Figure 2). Locations with historic populations (Tidal Influence 2012) were searched carefully. Additional focused searches were carried out in areas with sandy soil (for Lewis' evening primrose), tidal areas (for Coulter's goldfields), and open areas with little or no other vegetation (for southern tarplant). We mapped individuals and groups of plants using polygons in order to identify the specific areas where the target plants were detected and did not count individual plants. Polygons were drawn on paper aerial photos in the field, digitized in Google Earth Pro, and then imported to ArcGIS to produce the final maps. The error in polygon locations is estimated to be less than six feet (~2 m).

Both surveyors have considerable experience with Coulter's goldfields and southern tarplant throughout the species' ranges and plants were identified by sight. Parts of several individual plants of Lewis' evening primrose were collected and keyed out using the Digital Jepson Manual (Greenhouse et. al 2012) to confirm the identification of this species.

5.2 Results

Two of the three target species were found in 2018. The current mapping effort included a mixture of live plants and dead plants from the previous season. Overall there was significant site fidelity for southern tarplant and Lewis' evening primrose between different years (Figure 7).



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 7

Rare Plant Surveys

ESA

Southern Tarplant

Less than five live southern tarplant plants were found outside of irrigated restoration/mitigation sites, presumably due to the low rainfall in the winter of 2017-18. However, significant numbers (many thousands) of dead plants from the previous growing season were identified and mapped (Figure 7). The Southern and Central areas supported many hundreds of plants each, generally along the edges or roads and paths. The Isthmus supported thousands of live plants that presumably sprouted due to irrigation. The status of southern tarplant in the Alamitos Bay Partners parcel is not known. Virtually all of the plants were found in areas with very low cover of other species but adjacent to perennial salt marsh vegetation. Soils were typically heavy clay and often compacted (*e.g.*, road edges). Soil salinity was not measured, but based on the scarcity of typical glycophytic weeds, we assume the soil salinity is moderately high at least seasonally. These are typical growing conditions for this species throughout most of its range. There are large areas within the program area where this species was absent that could nevertheless potentially support this species. Therefore, opportunities to mitigate potential impacts to existing populations are plentiful on site.

Coulter's Goldfields

Coulter's goldfields was not seen in any of the previously mapped areas on LCWA land in 2018. Historic locations on other properties were not searched during this study due to lack of access. All of the intertidal areas with low perennial plant cover (its preferred habitat) were searched during the blooming period for this species. The apparent absence of this species this year is not surprising due to the very low rainfall. Coulter's goldfields typically germinates in the winter after enough rain falls to temporarily lower soil surface salinities in high marsh areas. It should be assumed that the areas where this species was found in 2011 (Figure 7) contain a valuable seed bank and in more favorable rain years, this species would reappear in those areas and possibly others. If restoration plans call for disturbance of soils or changes in hydrology in areas where this species is known to occur, pre-construction efforts should be made to collect seed on site to assure the genetics of this isolated population are preserved through post-construction re-introduction on site.

Lewis' Evening Primrose

Lewis' evening primrose was found in all three of the previous locations where it was mapped in 2011 (Figure 7). Despite the very low rainfall in 2017-18, this species was found throughout two large areas with very sandy soil on the Hellman Property. Each of these areas was supporting several hundred individual plants, distributed widely and somewhat sparsely. A single individual was found on the dirt road toward the eastern end of the Hellman Property; this was likely a larger population in 2011. The ecology of this species is more poorly understood than the other two species discussed in this report. It generally prefers very sandy soils (though the "road population" is on hard-packed heavy soils). It occurs in areas with very low cover of other plant species. It appears to be capable of germinating and establishing with very low amounts of rainfall – 2018 plants were much smaller than dead 2017 plants but were nearly as abundant. More study of this species is needed in order to develop realistic strategies for mitigating potential impacts to this species.

5.3 Implications for Restoration Planning

Restoration alternatives that expand the area of intertidal wetlands and transition zone habitats would likely support expansion of Coulter's goldfields and southern tarplant populations. These types of alternatives will likely call for significant alterations and disturbance in areas that are known to support these species currently and would trigger the need for mitigation that could be done on-site in newly restored habitats. Establishing southern tarplant on restoration sites is generally easy, as it grows readily on disturbed soils with low plant cover (especially if irrigation is used) by hand-dispersing seed. Restoring Coulter's goldfields on restoration sites is more challenging. The restoration site should be designed to support high marsh areas with low perennial plant cover and seasonally dynamic soil salinity (*e.g*., salt flats). Such areas might support introduction of this species. However, population sizes would be expected to vary greatly between years (due to amount and timing of rainfall).

Restoration alternatives that convert the areas where Lewis' evening primrose occurs to intertidal salt marsh or transition zone habitats will trigger mitigation measures for this species. On-site mitigation for this species may be difficult if all of the current populations are extirpated. The species currently occurs on human-placed soils that are essentially beach sand. In order to create a mitigation area (or areas), the existing sandy soil would need to be stockpiled and placed in the new area(s) or beach sand from another source could be used in order to re-create appropriate growing conditions. If one of the main populations is preserved, the remaining sandy area could be suitable as a mitigation site for the loss of habitat at the other site. It is also possible that an off-site mitigation site could be identified for this species (*e.g.,* El Segundo Dunes).

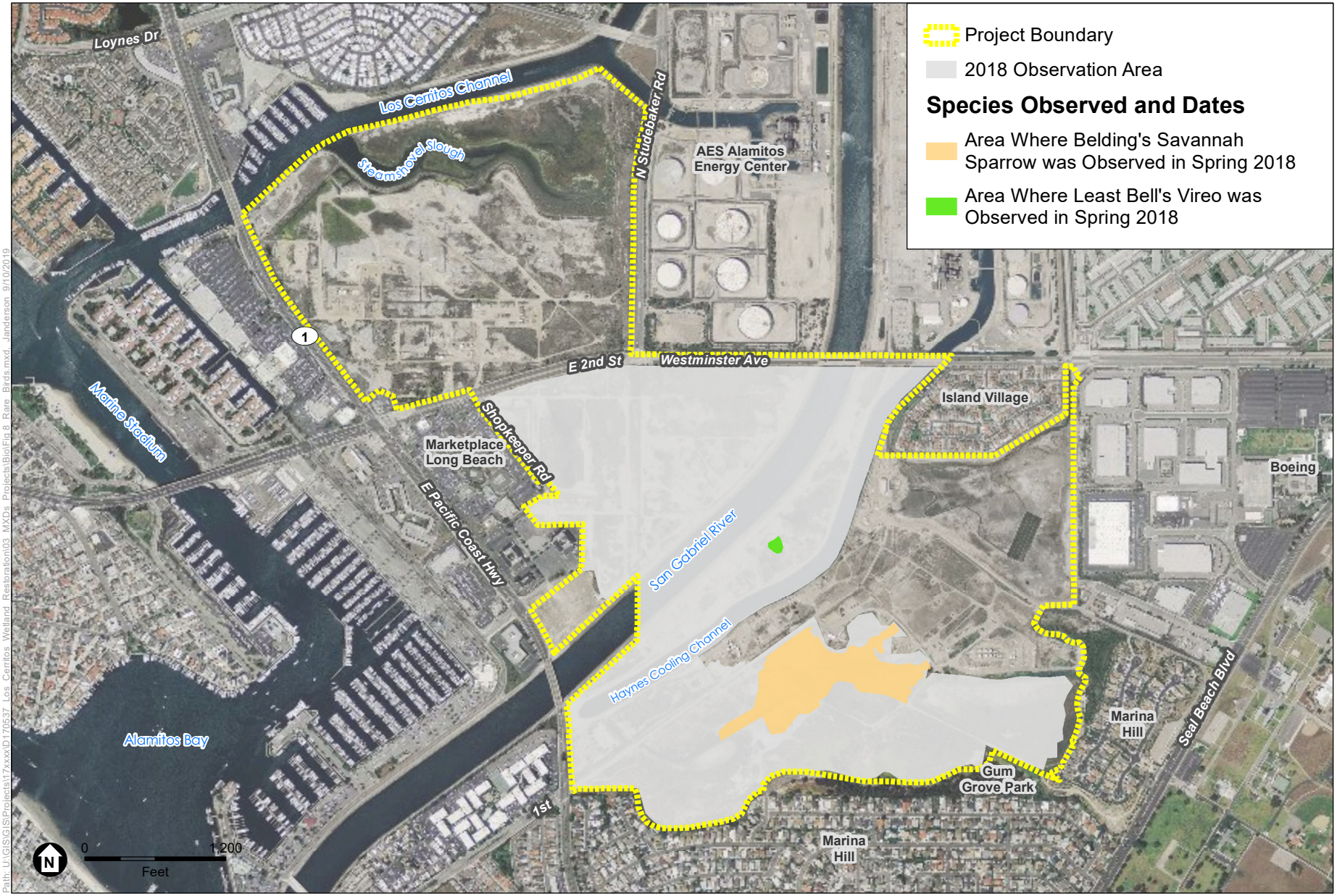
Appropriate amounts of seed should be collected for all three species prior to construction. Seed collection efforts should focus on wet years and not necessarily be delayed until the year before restoration begins.

SECTION 6. BIRD OBSERVATIONS

This section presents data on bird use of the LCW program area that is supplemental to the bird use analysis in the CRP, which was prepared by Tidal Influence (2012). CRC biologists collected incidental observations of bird use within the accessible portions of the site (South, Isthmus and Central) while doing vegetation surveys, rare plant surveys and wetland assessment work in between March 5 and May 10, 2018. Additional observations were made on a visit to the site on March 21, 2019 when wetland basins in the Central area were flooded. Appendix 1 summarizes bird records for the site from the CRP and CRC observations.

The birds observed on the list represent a diverse mix of resident and migrant species including groups associated with upland, wetland, and open water habitats. Four special status bird taxa were reported from the program area during the preparation of the CRP (Belding's savannah sparrow, burrowing owl [*Athene cunicularia*], loggerhead shrike [*Lanius ludovicianus*] and northern harrier [*Circus hudsonius*]) with two additional taxa occurring in other areas of the wetland complex (black skimmer [*Rynchops niger*] and California least tern [*Sterna antillarum* ssp. *browni*]). CRC biologists confirmed the presence of an additional special status species, least Bell's vireo [*Vireo bellii* ssp. *pusillus*], in spring of 2018 (Figure 8). Numerous Belding's savannah sparrows were observed in muted tidal wetlands in the program area in 2018 as well (Figure 8).

These sensitive taxa depend on a broad range of habitat types ranging from: open water (foraging for black skimmers and California least terns), tidal wetland (Belding's savannah sparrow), open or marsh habitat (northern harrier), grassland or open habitat (loggerhead shrike, burrowing owl), and riparian or scrub habitat (least Bell's vireo).



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 8

Rare Bird Observations

ESA

SECTION 7. REFERENCES

CDFW. 2018. List of Sensitive Natural Communities. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline

City of Long Beach. 2017. *Draft Environmental Impact Report for the Los Cerritos Wetlands Oil Consolidation and Restoration Project (SCH# 2016041083).* http://www.lbds.info/planning/environmental_planning/environmental_reports.asp

Dixon, J. 2003. *Designation of ESHA in the Santa Monica Mountains*. Memo to Ventura Staff. 24 pp. https://www.coastal.ca.gov/ventura/smm-esha-memo.pdf

Engel, J.D. 2015. Memorandum on ESHA and Wetland Determination for Banning Ranch, Orange County, California (CDP 5-13-032). https://documents.coastal.ca.gov/reports/2016/9/w14d-9-2016-a4.pdf

Greenhouse, J., Markos, S., Moe, R., Simono, S., Wetherwax, M., & Vorobik, L. (2012). *The Digital Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded* (Baldwin B., Goldman D., Keil D., Patterson R., Rosatti T., & Wilken D., Eds.). University of California Press. Retrieved from http://www.jstor.org/stable/10.1525/j.ctt1pn9sv

Moffat and Nichol. 2015. *Los Cerritos Wetlands Final Conceptual Restoration Plan. Final Report*. 340 pp.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp. Also retrieved from http://vegetation.cnps.org/whatsalliance

Tidal Influence. 2012. *Los Cerritos Wetlands Habitat Assessment Report: Habitat Types and Special Status Species*. 56pp.