

CHAPTER 2

Project Description

2.1 Introduction

The Los Cerritos Wetlands Authority (LCWA), as the Lead Agency pursuant to CEQA, is proposing to implement a restoration program for the Los Cerritos Wetlands Complex. The Los Cerritos Wetlands Restoration Plan (proposed program) (described in Section 2.7, *Program Characteristics*) identifies conceptual restoration designs for approximately 503 acres of land and water located on the border of Orange County and Los Angeles and County in the cities of Seal Beach and Long Beach. The program area contains large expanses of open space, including wetland habitat, as well as other uses described in more detail below. This Program Environmental Impact Report (PEIR) serves as a first-tier environmental document that focuses on the overall effects of implementing the activities that make up the program. As a first-tier environmental document, this PEIR will serve as the foundation for subsequent CEQA analysis (e.g., project-level EIRs, addendums) which may be conducted for project-specific restoration designs (see Section 1.2, *Purpose of the Environmental Impact Report*, in Chapter 1, *Introduction*). To provide LCWA with the broadest of foundations as a first-tier environmental document, where appropriate, assumptions have been made in describing the program features that would potentially result in the worst-case impacts¹. This ensures that the analysis in the PEIR documents the potential for environmental impacts from all of the projects under this program. Once LCWA begins the process of designing specific restoration projects, they will seek to minimize impactful aspects of the project, wherever feasible.

2.1.1 Los Cerritos Wetlands Authority

The LCWA, founded in 2006, is a joint powers authority consisting of the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC), State Coastal Conservancy (SCC), and cities of Seal Beach and Long Beach. The mission of the LCWA is to provide a comprehensive program of acquisition, protection, conservation, restoration, maintenance and operation, and environmental enhancement of the Los Cerritos Wetlands Complex, consistent with the goals of flood protection, habitat protection and restoration, and improved water supply, water quality, groundwater recharge, and water conservation. The LCWA currently owns 165 acres within the Program Area.

¹ For example, detailed data on soil contamination is not available for all of the sites within the program boundary, so this PEIR assumes a worst-case scenario that a large area of soil would need to be remediated. However, during future phases of the restoration design process, more data on soil contamination will be collected which in turn will be used to refine the restoration design so that a smaller area of soil requires remediation, thereby reducing impacts associated with larger-scale remediation.

2.1.2 Los Cerritos Wetlands Restoration Plan Planning Process

The first major step in the design process for the restoration of the Los Cerritos Wetlands Complex was the development of the Los Cerritos Wetlands Final Conceptual Restoration Plan (CRP; Moffatt & Nichol). The CRP is a restoration alternatives analyses report that provides the LCWA with a roadmap for habitat enhancement and improved public access for the Los Cerritos Wetlands Complex. Adopted by the LCWA Board of Directors in August 2015, the CRP identifies goals and objectives (see Section 2.5, *Los Cerritos Wetlands Restoration Plan Goals and Objectives*) and three restoration design alternatives (minimum alteration, moderate alteration, and maximum alteration) with varying degrees of alterations to existing site conditions under a range of sea-level rise scenarios. The report was prepared with input by the LCWA Steering Committee (made up of staff representing agencies of the LCWA joint powers authority), a Technical Advisory Committee (comprised of representatives of 20 resource and permitting agencies, and research groups covering federal, state, regional, and local jurisdictions), and the public (based on input during 6 community workshops). The plan is supported by 8 technical reports that provide baseline information for numerous topics including hydrology and hydraulics, soils, watersheds, and habitat. The CRP identified the next step in the restoration design process:

Further concept development of a hybrid alternative may occur at some point in the future to maximize benefits and minimize impacts of restoration. This work may include “mixing” and “matching” certain footprints of particular alternatives with those of different alternatives to create more alternatives that may provide more overall benefit than any of these individual concepts (pg 7).

In 2017, LCWA received funding to further the design of the alternatives identified in the CRP with the development of a program-level restoration design, to prepare a PEIR, and to prepare a Los Cerritos Wetlands Optimized Restoration Plan (expected to be completed in 2020). The purpose of the Los Cerritos Wetlands Optimized Restoration Plan is to provide a conceptual basis of design for the restoration of the Los Cerritos Wetlands Complex, and to provide guidance for future phases of the restoration process. Future phases of the restoration would involve identifying individual projects, and developing more detailed, project-level designs (i.e., engineering designs, grading plans) and analysis (i.e., wetland delineation reports).

After the PEIR, the Los Cerritos Wetlands Optimized Restoration Plan will be developed. The restoration design presented in the Los Cerritos Wetlands Optimized Restoration Plan will be informed by this PEIR and public input.

2.2 Program Area

2.2.1 Regional Location

The proposed program is located within the cities of Seal Beach and Long Beach. The City of Seal Beach is within the northwestern portion of Orange County, California. The City of Long Beach is within the southeastern portion of Los Angeles County, California.

The City of Seal Beach is bounded by the City of Long Beach to the west; the City of Los Alamitos and the neighborhood of Rossmoor to the north; and the cities of Huntington Beach, Westminster and Garden Grove to the east. The Pacific Ocean borders the City of Seal Beach to the south. The U.S. Navy Naval Weapons Station Seal Beach is located within Seal Beach city boundaries to the southeast of the program area.

The City of Long Beach is bounded by the cities of Carson and Los Angeles, the neighborhood of Wilmington, and the Port of Los Angeles to the west; the cities of Compton, Paramount, and Lakewood to the north; and the cities of Hawaiian Gardens, Cypress, Los Alamitos, and Seal Beach to the east. The Pacific Ocean borders the City of Long Beach to the south.

Figure 2-1, *Regional Location*, shows the regional location of the proposed program.

Regional access to the program area is provided by Interstate 405 (I-405) and Interstate 605 (I-605) as well as State Route 22 (SR-22) which terminates as 7th Street. Pacific Coast Highway (SR-1) traverses the area from the northwest corner to the southeast corner. Locally, 2nd Street, Loynes Drive, and 7th Street all provide east/west connections across the area (City of Long Beach 2016).

2.2.2 Project Vicinity

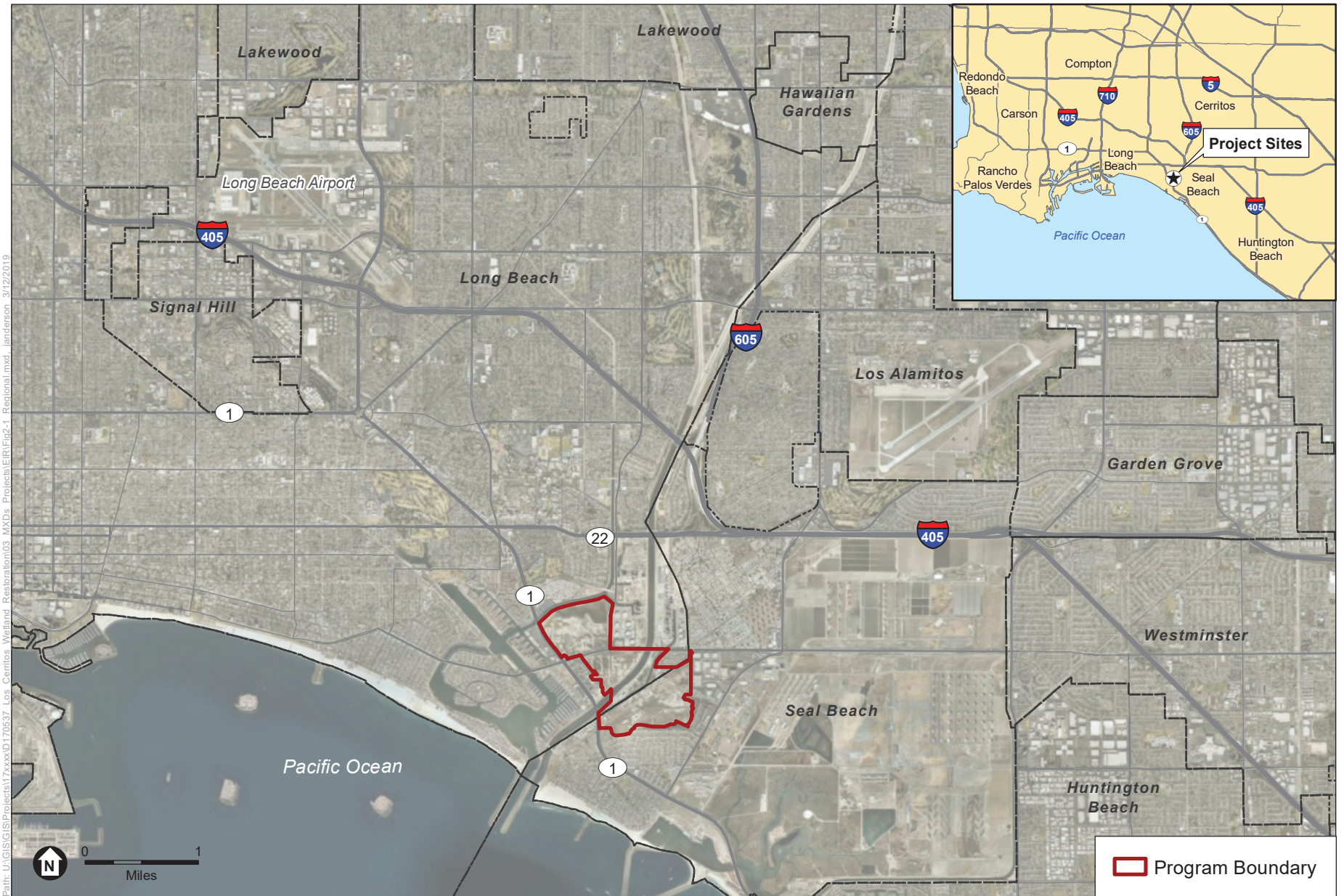
The program area is located in West Seal Beach and East Long Beach, straddling the border of Orange County and Los Angeles County in southern California (see **Figure 2-2, *Program Area and Local Vicinity***). Three major channels are present in the program area: Los Cerritos Channel, San Gabriel River, and the Haynes Cooling Channel. A remnant historic tidal channel, called Steamshovel Slough, is also present, and drains to the Los Cerritos Channel.

Figure 2-2 illustrates the program area relative to its immediate surroundings.

2.2.3 Project Areas

For purposes of organizing the environmental analysis and discussion, the proposed program has been separated into 4 areas (South, Isthmus, Central, and North) and 17 individual sites (Figure 2-2). The program boundary totals approximately 503 acres of land and water. Property within the program boundary is held by 10 landowners. Each area's location and ownership is provided in more detail below:

- **South Area:** The South Area is bounded by the Isthmus and Island Village to the north, industrial and residential development to the east, residential development to the south, and the Pacific Coast Highway to the west. It includes the **Haynes Cooling Channel** owned by the City of Los Angeles Department of Water and Power, along with two small upland parcels owned by the City of Long Beach and the State of California, the **State Lands Parcel** site owned by the State of California, the **South LCWA** site owned by the LCWA, the **Hellman Retained** site owned by Hellman Properties, LLC, and the **Los Alamitos Pump Station** and **Los Alamitos Retarding Basin** sites, both owned by the County of Orange Flood Control District. The South area is within the City of Seal Beach with the exception of the Haynes Cooling Channel and Los Alamitos Retarding Basin site which are within both the cities of Seal Beach and Long Beach, and Los Alamitos Pump Station site which is within the City of Long Beach. (Assessor's Parcel Numbers: 7237-020-902, 7237-020-900, 7237-



SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-1
Regional Location



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-2
Project Site and Local Vicinity

020-275, 7237-020-276, 7237-020-280, 7237-020-281, 7237-020-282, 7237-020-282, 0431-603-6, 0431-605-3, 0431-604-5, 0950-106-3, 0950-106-4, 0950-106-7, 0950-106-8, 0950-103-6, 7237-020-277, 7237-020-278, and 7237-020-279).

- **Isthmus Area:** The Isthmus Area is bounded by the San Gabriel River and 2nd Street to the north, Haynes Cooling Channel to the east and south, and Pacific Coast Highway to the west. It includes the **Callaway Marsh** site owned by the City of Los Angeles Department of Water and Power, the **Isthmus LCWA** site owned by the LCWA (surface rights only), **Zedler Marsh** site owned by the LCWA, the **Isthmus Bryant** site owned by Bryant Dakin, LLC, and the **DWP** site owned by the City of Los Angeles Department of Water and Power. The Isthmus area is within the City of Long Beach. Portions of 2nd Street adjacent to the individual sites are also part of the Isthmus Area (Assessor's Parcel Numbers: 7237-020-275, 7237-020-276, 7237-020-901, 7237-020-054)
- **Central Area:** The Central Area is bounded by 2nd Street to the north, the Isthmus to the east and south, and commercial-retail uses at the Marketplace Long Beach development to the west. It includes the **Central LCWA** site owned by the LCWA (surface rights only), the **Central Bryant** site owned by Bryant Dakin, LLC, the **Long Beach City Property** site owned by the City of Long Beach, the **Pumpkin Patch** site owned by Lyon Housing, and the **San Gabriel River**. The portion of the San Gabriel River that is located within the program boundary is owned by the LCWA. Portions of 2nd Street and Shopkeeper Road adjacent to the individual sites are also part of the Central area. The Central area is within the City of Long Beach. (Assessor's Parcel Numbers: 7237-020-901, 7237-020-903, 7237-020-053, 7237-020-044, 7237-020-045, and 7237-020-043)
- **North Area:** The North Area is bounded by the Los Cerritos Channel to the north, Studebaker Road to the east, 2nd Street to the south, and Pacific Coast Highway to the west. It includes the **Northern Synergy Oil Field** site and **Southern Synergy Oil Field** site owned by Los Cerritos Wetlands, LLC, and **Alamitos Bay Partners** site owned by Alamitos Bay Partnership, LLC. The North area is within the City of Long Beach. (Assessor's Parcel Numbers: 7237-022-012, 7237-017-010, 7237-017-011, 7237-017-012, 7237-017-013, 7237-017-014, 7237-017-018, and 7237-017-019)

2.3 Existing Land Management and Site Conditions

2.3.1 Property Ownership and Oil Leases

There are four oil leases operated within the program area (see **Figure 2-3, Oil Operators**). These oil leases are owned and/or managed by Hellman Properties, LLC, Signal Hill Petroleum, Inc., Synergy Oil and Gas, LLC, and Termo Company (Moffatt & Nichol, 2015).

The LCWA has an agreement with Signal Hill Petroleum, Inc. on the Central LCWA and Isthmus LCWA sites that allows the oil operator to remove vegetation from around their mineral extraction equipment consistent with the requirements of the City of Long Beach Fire Department and the California Geologic Energy Management Division (CalGEM) [formerly known as the Division of Oil, Gas, and Geothermal Resources (DOGGR)]. The oil operator compensates for this impact by providing the LCWA with an annual fee to be used for wetlands habitat restoration.

The City of Long Beach has an agreement with LCW Oil Operations, LLC on the Long Beach City Property site that includes clauses for relocating oil infrastructure and abandoning wells (Moffatt & Nichol, 2015).



SOURCE: Moffatt Nichol, 2015

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-3
Oil Operators

2.3.2 Site Conditions by Program Area

The program area is composed of four individual areas, as described above in Section 2.2.3, *Project Areas*, and totals approximately 503 acres of land and water. Information in this section is presented for individual sites within each of the four program areas, and generally addresses existing land uses, current oil operators and land managers, habitat types, known presence of special-status plant and animal species, vehicular access to individual sites and existing public access opportunities. Determination of habitat types and presence of special-status plants and animal species is based on *Los Cerritos Wetlands Habitat Assessment Report: Habitat Types and Special Status Species* prepared by Tidal Influence in 2012 and field observation by EIR project team biologists during site visits conducted in 2018. This section is also informed by field observation during site visits conducted by EIR project team engineers and designers and architectural historian and cultural resource specialists during 2018 and 2019.

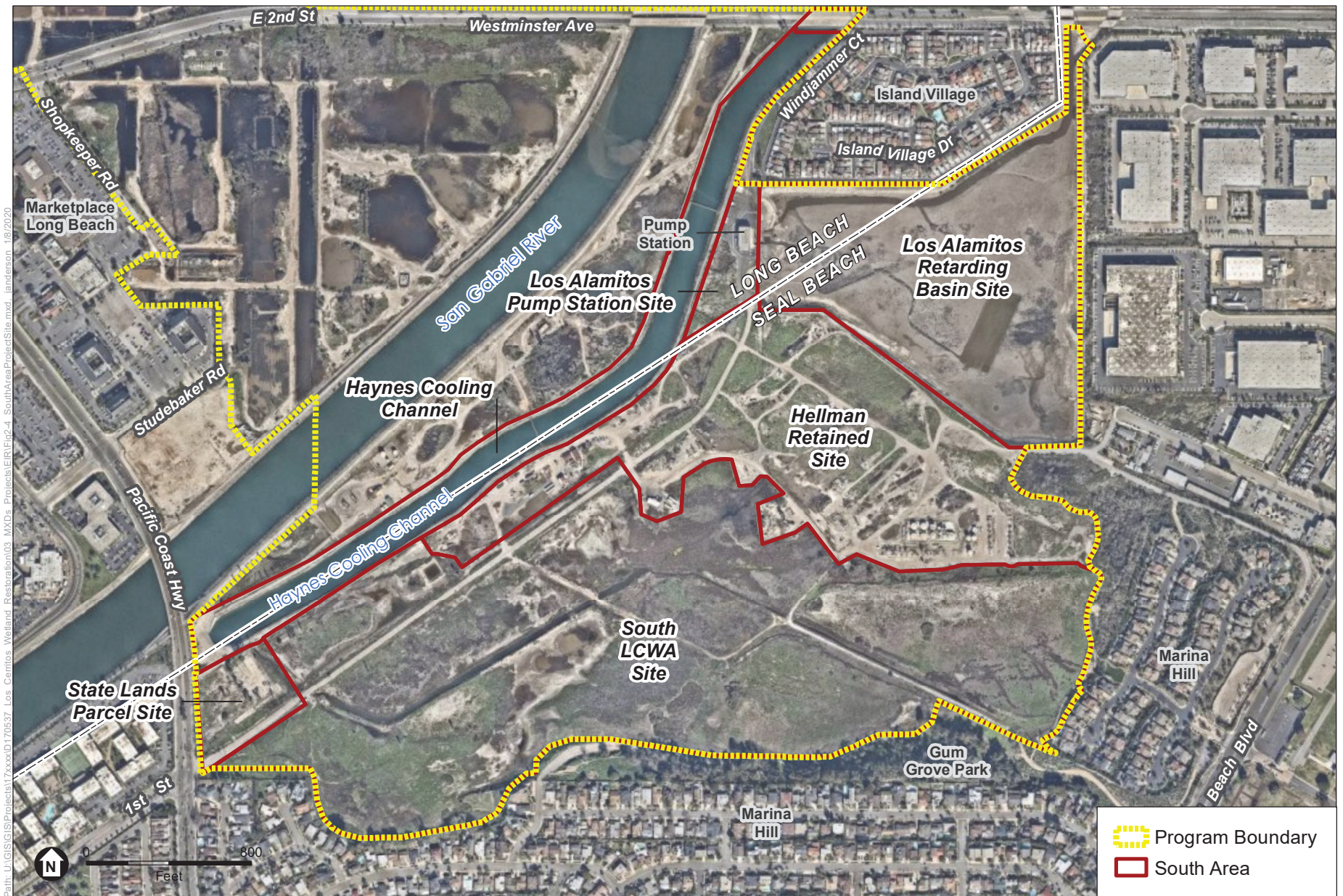
2.3.2.1 South Area

The South Area includes the following individual sites: Haynes Cooling Channel, State Lands Parcel, South LCWA, Hellman Retained, Los Alamitos Pump Station, and Los Alamitos Retarding Basin (**Figure 2-4, South Area**).

The Haynes Cooling Channel is a waterway used by the Haynes Generating Station located north of the program area to bring in water from the Pacific Ocean via 7 culverts in the Alamitos Bay Marina to cool the power plant through a method called once-through cooling. Once the water is used, it is discharged into the San Gabriel River slightly upstream of where the River crosses under 2nd Street. The Haynes Generating Station, owned and operated by the City of Los Angeles Department of Water and Power (LADWP), is a natural gas and steam power plant that was built in the mid-1960s. The Haynes Generating Station is undergoing a modernization project that would eliminate the use of ocean water to cool the power plant by 2029. Once the modernization project is completed, the Haynes Cooling Channel will be decommissioned and no longer be in use for the Haynes Generating Station.

The State Lands Parcel site contains the remnant building foundation of what was once a music venue called the Airport Club and Marina Palace. Major habitat types include ruderal uplands and southern coastal salt marsh with muted tidal connection in the channel that runs along the south of the parcel. Portions of the site that do not contain the remnant building foundation support special-status plant and animal species (**Table 2-1, Special-Status Species Known to Occur in the South Area**). Access to the site is available via an existing gated driveway on 1st Street.

The South LCWA site contains multiple former sumps, landfills, and contaminated areas from prior oil operations, and is currently owned and maintained by the LCWA. Some areas of tidal southern coastal salt marsh still persist on the site but other areas were converted by previous land owners. Conversion from coastal salt marsh habitat to primarily ruderal uplands with no tidal connections occurred due to extensive filling of the property from dredged material associated with the excavation of the Haynes Cooling Channel in the 1960s. Former access roads still bisect the site and cause ecological and hydrological fragmentation. Remnant geomorphic features indicate historic southern coastal bluffs.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-4
South Area

**TABLE 2-1
SPECIAL STATUS SPECIES KNOWN TO OCCUR IN THE SOUTH AREA**

Special-Status Species	Scientific Name	Haynes Cooling Channel	State Lands Parcel	South LCWA	Hellman Retained	Los Alamitos Retarding Basin	Los Alamitos Pump Station
Flora							
California Boxthorn	<i>Lycium californicum</i>			P			
Coulter's Goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>			P	P		P
Estuary Sea-Blite	<i>Suaeda esteroa</i>						
Lewis' Evening Primrose	<i>Camissonia lewisii</i>			P			
Southern Tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>		P	P	P	P	P
Southwestern Spiny Rush	<i>Juncus acutus</i> ssp. <i>leopoldii</i>						P
Woolly Sea-Blite	<i>Suaeda taxifolia</i>					P	P
Fauna							
Belding's Savannah Sparrow	<i>Passerculus sandwichensis beldingii</i>	P		P		P	P
Black Skimmer	<i>Rynchops niger</i>	P					
Burrowing Owl	<i>Athene cunicularia</i>						
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>						
California Least Tern	<i>Sterna antillarum browni</i>	P		P			
Least Bell's Vireo	<i>Vireo bellii pusillus</i>						
Loggerhead Shrike	<i>Lanius ludovicianus</i>		P	P	P	P	
Mudflat Tiger Beetle	<i>Cicindela trifasciata sigmoidea</i>						
Northern Harrier	<i>Circus cyaneus</i>		P	P	P	P	P
Pacific Green Sea Turtle	<i>Chelonia mydas</i>	P					
Red-Diamond Rattlesnake	<i>Crotalus ruber</i>						
Salt Marsh Tiger Beetles	<i>Cicindella trifasciata sigmoides</i>						
Salt Marsh Wandering Skipper	<i>Panoquina errans</i>			P	P	P	P
Short-Eared Owl	<i>Asio flammeus</i>						
Yellow-Breasted Chat	<i>Icteria virens</i>		P	P	P	P	
White-Tailed Kite	<i>Elanus leucurus</i>						
P = species presence							
SOURCES: Tidal Influence, 2012; Field observation in 2018							

The Hellman Channel is a small, muted tidal channel that connects to the San Gabriel River through a culvert that goes around the southern end of the Haynes Cooling Channel and above the siphons connecting the cooling channel to the Alamitos Bay Marina. The Hellman Channel runs through the South LCWA site and provides habitat for several special-status animal and plant species (Table 2-1). The site is accessed via a gated private road on 1st Street.

The Hellman Retained site is an active oil field with substantial oil operation infrastructure (pipelines, pumps, tanks, and roadways). There are 43 active oil wells and 11 idle oil wells on site. The Hellman Retained site is owned and operated by Hellman Properties, LLC. Historically, the site was primarily coastal salt marsh habitat; today the parcel is composed mostly of ruderal wetlands with no tidal connection. Past surveys indicate that the Hellman Retained site may host several special status plant species (Table 2-1). Access to the site is available via a gated private road on 1st Street.

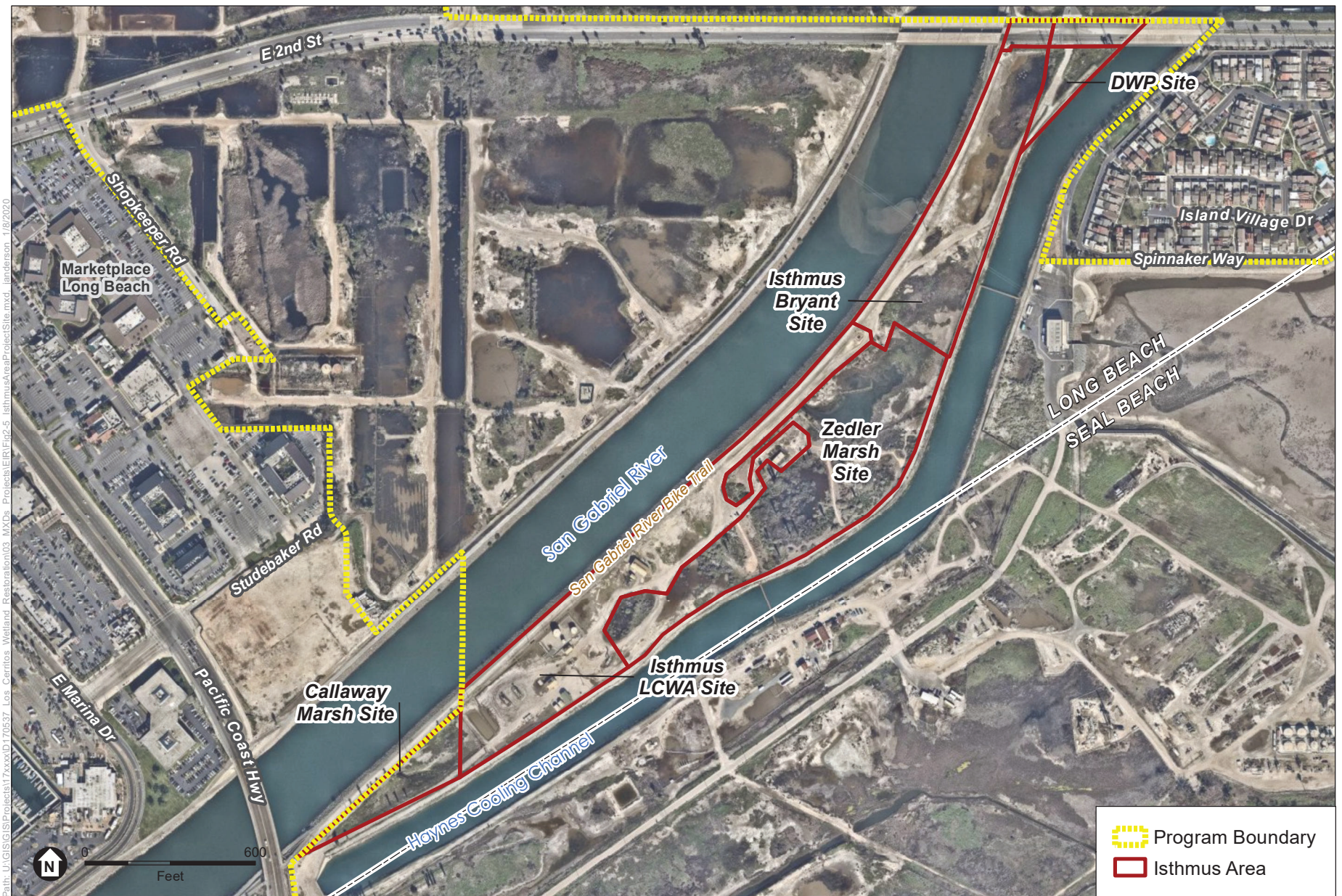
The Los Alamitos Retarding Basin site is a 30-acre depressed basin surrounded by an earthen berm and access road that receives stormwater runoff and other drainage from a 3,600-acre area in the City of Seal Beach. The site is owned and operated by the County of Orange Flood Control District. The retarding basin provides habitat for several special-status animal species (Table 2-1). Access to the site is from 1st Street via locked gates on a private road, or off Adolfo Lopez Drive through a similarly gated private road.

The Los Alamitos Pump Station site includes a pump station, which moves the stormwater runoff from the Los Alamitos Retarding Basin, under the San Gabriel River Levee, and into the San Gabriel River. The site is owned and operated by the County of Orange Flood Control District. The site includes a wetland and upland habitat restoration site (not tidally connected) constructed to mitigate for the pump station impacts. The Los Alamitos Pump Station site provides habitat for several special-status animal/plant species (Table 2-1). Access to the site is via 1st Street via locked gates on a private road, or off Adolfo Lopez Drive through a similarly gated private road.

The South Area has some existing public access located just outside the program boundary. A small public parking lot is located off of Seal Beach Boulevard providing access to the Hellman Ranch Trail. The trail runs west and north between the Heron Pointe residential neighborhood and the South Area and includes interpretive signage, benches, and a gathering area. The north end of the trail ends at a locked gate at the boundary of the oil operations. The Hellman Ranch trail also connects west to the Gum Grove Trail in Gum Grove Park and is served by a second, small, public parking area accessed from Avalon Drive along the south program boundary. Gum Grove Trail and Hellman Ranch Trail combine to provide approximately a 1-mile trail just outside the South Area program boundary. A gated and locked access drive from 1st Street provides occasional guided access to restricted areas within the site.

2.3.2.2 Isthmus Area

The Isthmus Area includes the following individual sites: Callaway Marsh, DWP, Zedler Marsh, Isthmus LCWA, and Isthmus Bryant (**Figure 2-5, Isthmus Area**).



SOURCE: Mapbox, LCWA

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Figure 2-5
Isthmus Area

The Callaway Marsh site is a vacant site with a heavily degraded perched salt marsh, tidally connected to the San Gabriel River by a three-foot-wide culvert, which mutes the water levels reaching the site. The site contains salt marsh plant communities and is surrounded by ruderal upland species that support special-status plant and animal species (**Table 2-2, *Special-Status Species Known to Occur in the Isthmus Area***). Access to the site is available via an existing driveway on Pacific Coast Highway.

TABLE 2-2
SPECIAL-STATUS SPECIES KNOWN TO OCCUR IN THE ISTHMUS AREA

Special-Status Species	Scientific Name	Callaway Marsh	Zedler Marsh	Isthmus LCWA	Isthmus Bryant	DWP
Flora						
California Boxthorn	<i>Lycium californicum</i>		P			
Coulter's Goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>		P			
Estuary Sea-Blite	<i>Suaeda esteroa</i>		P			
Lewis' Evening Primrose	<i>Camissonia lewisii</i>					
Southern Tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>	P	P	P	P	P
Southwestern Spiny Rush	<i>Juncus acutus</i> ssp. <i>leopoldii</i>		P		P	
Woolly Sea-Blite	<i>Suaeda taxifolia</i>		P			
Fauna						
Belding's Savannah Sparrow	<i>Passerculus sandwichensis beldingii</i>	P	P		P	
Black Skimmer	<i>Rynchops niger</i>					
Burrowing Owl	<i>Athene cunicularia</i>	P		P		
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>					
California Least Tern	<i>Sterna antillarum browni</i>		P			
Least Bell's Vireo	<i>Vireo belii pusillus</i>		P			
Loggerhead Shrike	<i>Lanius ludovicianus</i>	P	P	P	P	
Northern Harrier	<i>Circus cyaneus</i>	P	P	P	P	
Pacific Green Sea Turtle	<i>Chelonia mydas</i>					
Red-Diamond Rattlesnake	<i>Crotalus ruber</i>					
Salt Marsh Tiger Beetles	<i>Cicindella trifasciata sigmoides</i>		P			
Salt Marsh Wandering Skipper	<i>Panoquina errans</i>	P	P	P	P	
Short-Eared Owl	<i>Asio flammeus</i>					
Yellow-Breasted Chat	<i>Icteria virens</i>	P	P	P	P	
White-Tailed Kite	<i>Elanus leucurus</i>					

P = species presence

SOURCE: Tidal Influence, 2012; Field observation in 2018

The Zedler Marsh site is a 12-acre restoration site operated and managed by the LCWA and is currently being enhanced and restored as part of the LCWA Stewardship Program (see Section 2.4.3, *Los Cerritos Wetlands Stewardship Program*, for more information). Recent restoration activity involved the removal of over 50,000 pounds of trash and debris and installation of nearly 5,000

native plants by community volunteers. The site contains tidal salt marsh and surrounding habitat. The site receives muted tidal circulation via a three-foot wide culvert connection to the San Gabriel River. Special-status plants and animals are present on the site (Table 2-2). The site can be accessed via existing gated driveways on Pacific Coast Highway and 2nd Street.

The Isthmus LCWA site is an active oil field maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights. The oil operation infrastructure includes 4 active oil wells, 2 water injection wells, 1 idle oil well a tank farm, associated buildings, and an exclusive use easement area. The site contains a mix of disturbed ruderal habitats. Special-status plants and animals are present on the site (Table 2-2). The site can be accessed via existing private gated driveways on Pacific Coast Highway and 2nd Street.

The Isthmus Bryant site is a vacant site and the surface is not currently in use by oil operators. The site contains salt flat and alkali meadow wetland habitat types but is fragmented both ecologically and hydrologically by the access road that bisects the site. The site is adjacent to Zedler Marsh and two culverts in the access road allow some hydrologic connection between the area adjacent to Zedler Marsh and the area northwest of the road during major high tide events. The site supports special-status plant and animal species (Table 2-2). Access to the Isthmus Bryant site is via an existing gated driveway on 2nd Street.

The DWP site is a vacant site. The site contains upland and wetland habitat types, with no hydrologic connection. The site is adjacent to Isthmus Bryant site. The site supports a special-status plant species (Table 2-2). Access to the DWP site is via an existing gated driveway on 2nd Street.

Restricted public access to the trails and other public amenities at the Zedler Marsh site is available from the San Gabriel River Trail located in the Central Area via a locked gate located on the trail midway between Pacific Coast Highway and 2nd Street. The Zedler Marsh site facilities include an outdoor classroom area, native plant restoration area, benches, picnic tables, informational kiosks, and a native wetland nursery. A fishing area is located at the southwest end of the Haynes Cooling Channel at the west end of the Isthmus Area. It can be accessed from the San Gabriel River Trail, or by vehicle or bicycle from Pacific Coast Highway, and has a small gravel parking area adjacent to the fishing spot. A network of gated maintenance roads connects from the fishing spot at the west end to the Zedler Marsh site and out to 2nd Street at the east end of the Isthmus. There is a bike lane along Pacific Coast Highway, which also serves as a pedestrian path between the San Gabriel River Trail and the fishing area, as well as along 2nd Street. There are no sidewalks along the Pacific Coast Highway or 2nd Street. Dirt footpaths have developed in some areas due to the lack of pedestrian infrastructure.

2.3.2.3 Central Area

The Central Area includes the following individual sites: Pumpkin Patch, Long Beach City Property, Central LCWA, Central Bryant, and the San Gabriel River (**Figure 2-6, Central Area**).

The majority of the Pumpkin Patch site is vacant land zoned for commercial use. The site within the program boundary has an active oil field with an oil well and associated pipeline. There is one active oil well on site. The oil infrastructure is maintained and operated by Synergy Oil and Gas, LLC. The site contains ruderal upland habitat type and southern coastal salt marsh. Special-status



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-6
Central Area

plants and animals are present on site (**Table 2-3, Special-Status Species Known to Occur in the Central Area**). Vehicular access to the site is via Pacific Coast Highway.

**TABLE 2-3
SPECIAL-STATUS SPECIES KNOWN TO OCCUR IN THE CENTRAL AREA**

Special-Status Species	Scientific Name	Pumpkin Patch	Long Beach City Property	Central LCWA	Central Bryant	San Gabriel River
Flora						
California Boxthorn	<i>Lycium californicum</i>					
Coulter's Goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>					
Estuary Sea-Blite	<i>Suaeda esteroa</i>					
Lewis' Evening Primrose	<i>Camissonia lewisii</i>					
Southern Tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>	P	P	P	P	
Southwestern Spiny Rush	<i>Juncus acutus</i> ssp. <i>leopoldii</i>					
Woolly Sea-Blite	<i>Suaeda taxifolia</i>					
Fauna						
Belding's Savannah Sparrow	<i>Passerculus sandwichensis beldingii</i>	P		P		
Black Skimmer	<i>Rynchops niger</i>					P
Burrowing Owl	<i>Athene cunicularia</i>					
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>					
California Least Tern	<i>Sterna antillarum browni</i>					P
Least Bell's Vireo	<i>Vireo belii pusillus</i>					
Loggerhead Shrike	<i>Lanius ludovicianus</i>		P	P	P	
Pacific Green Sea Turtle	<i>Chelonia mydas</i>					P
Red-Diamond Rattlesnake	<i>Crotalus ruber</i>					
Salt Marsh Tiger Beetles	<i>Cicindella trifasciata sigmoides</i>					
Salt Marsh Wandering Skipper	<i>Panoquina errans</i>	P	P	P	P	
Northern Harrier	<i>Circus cyaneus</i>		P	P	P	
Short-Eared Owl	<i>Asio flammeus</i>					
Yellow-Breasted Chat	<i>Icteria virens</i>		P	P	P	
White-Tailed Kite	<i>Elanus leucurus</i>					
P = species presence						
SOURCE: Tidal Influence, 2012; Field observation in 2018						

The Long Beach City Property site is an active oil field with oil storage tanks and associated oil production infrastructure, such as pipelines. There are 11 active oil wells and 2 idle oil wells on site. Aboveground pipelines and dirt access roads traverse the site. A majority of the site is disturbed, and vegetation is generally sparse. Existing road and oil well pads severely fragment the site ecologically and hydrologically. The oil field is maintained and operated by Synergy Oil and Gas, LLC. The site contains southern coastal brackish marsh habitat where urban stormwater runoff is

directed via storm drains onto the salty soils of formerly tidal areas. Alkali meadow, southern coastal salt marsh, and ruderal upland habitat types are also present. There is a perched culvert at the southern tip of the property that receives tidal waters during major high tide events, but the majority of the site is non-tidal. Special-status plants and animals are present throughout the site (Table 2-3). Vehicular access to the site is via an existing gated driveway along Shopkeeper Road.

The Central LCWA site is an active oil field with oil operation infrastructure (roadways, wells, power lines, pipelines, and pumps), which severely fragment the site ecologically and hydrologically. The oil wells are accessed via raised dirt roads that vary from 10 to 30 feet in width. There are 7 active oil wells on site. The oil field is maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights. The site is composed of a mixture of native and non-native wetland habitats, including southern coastal salt marsh, alkali meadow, and salt flat, and non-native upland habitats. The Central LCWA site is disconnected from any tidal action. The site contains several special-status plant and animal species (Table 2-3). Vehicular access to the site is through the Long Beach City Property site. Restricted access is also available along the north levee of the San Gabriel River, which can be accessed from Pacific Coast Highway and 2nd Street.

The Central Bryant site is an undeveloped, vacant site with no active oil operations. Stormwater runoff supports mulefat scrub and other wetland habitats on parts of the site. The site is comprised of southern coastal salt marsh, alkali meadow, salt flat, and ruderal wetland and upland habitats and is disconnected from tidal action. The site contains special-status plant and animal species (Table 2-3). Vehicular access to the Central Bryant site is not currently available.

The San Gabriel River is a waterway that originates in the San Gabriel Mountains and flows generally south for 58 miles, passing through 19 cities before reaching the Pacific Ocean (LADPW, 2019), approximately 0.75 miles southwest of the program area. The San Gabriel River drains a watershed of 640 square miles. There are levees along the north and south banks of the San Gabriel River within the program boundary. LCWA owns the levees as part of their property that extends from the Central Area into the Isthmus Area (APN #7237-020-901). The Los Angeles County Flood Control District (LACFCD) currently operates and maintains these levees consistent with the U.S. Army Corps of Engineers' Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) Manual for the Los Angeles County Drainage Area project (Corps 1999, as amended).

The Class 1 San Gabriel River Trail runs on the levee along the south bank of the San Gabriel River and extends upstream beyond the program area to the Azusa River Wilderness Park located about 38 miles inland. There are access points to the trail at both Pacific Coast Highway and 2nd Street, at either end of the Central Area. The levee along the north bank is closed to public access with gates and fences at each end. On-street public parking is available on Shopkeeper Road.

Restricted public access to the Central LCWA site is available. Existing bike lanes are provided along 2nd Street. Dirt footpaths have developed between the curb and fence along the street frontages due to the lack of pedestrian infrastructure. There are partial crosswalks at the south and west crossing points at the intersection of 2nd Street and Shopkeeper that do not connect to sidewalks on the north or east sides of the intersection.

2.3.2.4 North Area

The North Area includes the following individual sites: Northern Synergy Oil Field, Southern Synergy Oil Field, and Alamos Bay Partners (**Figure 2-7, North Area**).

The Northern Synergy Oil Field site is an undeveloped, vacant site with no active oil operations. It is separated from the oil operation areas to the south by an earthen berm and varying expanses of open space. It contains Steamshovel Slough, an area of tidally influenced salt marsh, tidal channels, and mudflats. Steamshovel Slough is a relatively pristine remnant of the historic tidal marsh of Alamos Bay Marina. Steamshovel Slough is considered a historic or “ancient” marsh in that it has not been modified through dredging or filling. The site also supports a variety of wetland flora and fauna, including special-status plants, animals, and insects, and federally and state-listed animals (**Table 2-4, Special-Status Species Known to Occur in the North Area**). Vehicular access to the Northern Synergy Oil Field site is not currently available.

The Southern Synergy Oil Field site is an active oil field with oil production and wells, tank farms, a network of roads and pipelines, and other oil production-related infrastructure, including the Bixby Ranch Field Office. There are 22 active oil wells and 17 idle oil wells on site. The oil operation is maintained and operated by Synergy Oil and Gas, LLC. The site supports salt marsh habitat and areas with non-native plant species. The site is subject to tidal influence. A series of pipes are used to restrict the tidal influence from interfering with oil operations in the Synergy Oil Field site. The site supports special status species (Table 2-4). Vehicular access to the site is via an existing gated driveway on 2nd Street.

The Alamos Bay Partners site is an active oil field with oil wells and associated oil production infrastructure, such as pipelines and tanks. There are three active oil wells and one idle oil well on site. Dirt access roads traverse the site. The oil field is maintained and operated by The Termo Company. A majority of the site is disturbed, and vegetation is generally sparse. The site contains southern coastal salt marsh and ruderal wetlands habitats. The site is connected to muted tidal action in the northern-most end of the site via a small culvert. Special-status plant and animal species are present on the site (Table 2-4). Vehicular access to the site is via an existing driveway along Pacific Coast Highway.

The North Area is mostly fenced along the street frontages and closed to public access. There are existing bike lanes on Studebaker Road and the north half of the Pacific Coast Highway frontage. There are no existing sidewalks along the streets. Dirt footpaths have developed between the curb and fence along the street frontages due to the lack of pedestrian infrastructure. The only public access currently available to the Southern Synergy Oil Field Site is views of the site from the street or footpath through a chain-link fence. The Los Cerritos Channel likely provides some public access for boaters and kayakers along the north perimeter. Floating booms across Steamshovel Slough at the confluence with the channel restrict access into the Northern Synergy Oil Field site, but have a kayak crossing that allows guided access to the slough.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-7
North Area

TABLE 2-4
SPECIAL-STATUS SPECIES KNOWN TO OCCUR IN THE NORTH AREA

Special Status Species	Scientific Name	Northern Synergy Oil Field	Southern Synergy Oil Field	Alamitos Bay Partners
Flora				
California Boxthorn	<i>Lycium californicum</i>			
Coulter's Goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>			
Estuary Sea-Blite	<i>Suaeda esteroa</i>	P		
Lewis' Evening Primrose	<i>Camissonia lewisii</i>			
Southern Tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>	P	P	P
Southwestern Spiny Rush	<i>Juncus acutus</i> ssp. <i>leopoldii</i>			
Woolly Sea-Blite	<i>Suaeda taxifolia</i>	P		
Fauna				
Belding's Savannah Sparrow	<i>Passerculus sandwichensis beldingii</i>	P	P	P
Black Skimmer	<i>Rynchops niger</i>	P		
Burrowing Owl	<i>Athene cunicularia</i>			
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>	P		P
California Least Tern	<i>Sterna antillarum browni</i>	P		
Least Bell's Vireo	<i>Vireo belii pusillus</i>			
Loggerhead Shrike	<i>Lanius ludovicianus</i>	P	P	P
Mudflat Tiger Beetle	<i>Cicindela trifasciata sigmoidea</i>	P		
Northern Harrier	<i>Circus cyaneus</i>	P	P	P
Pacific Green Sea Turtle	<i>Chelonia mydas</i>	P		
Red-Diamond Rattlesnake	<i>Crotalus ruber</i>	P	P	P
Salt Marsh Tiger Beetles	<i>Cicindella trifasciata sigmoides</i>	P		
Salt Marsh Wandering Skipper	<i>Panoquina errans</i>	P	P	
Short-Eared Owl	<i>Asio flammeus</i>	P		
Yellow-Breasted Chat	<i>Icteria virens</i>	P	P	P
White-Tailed Kite	<i>Elanus leucurus</i>	P	P	P

P = species presence
SOURCES: Tidal Influence, 2012; Field observation in 2018

2.4 Background

2.4.1 History of the Los Cerritos Wetlands Complex

Until the late 1800s, the wetlands within and beyond the program area, collectively known as the Los Cerritos Wetlands Complex, spanned approximately 2,400 acres and consisted of a network of tidal channels, vegetated wetlands, and upland areas. Historically, the Los Cerritos Wetlands Complex was almost entirely tidal wetland, with a few natural streams and intertidal flat channels.

Beginning in the late 1800s, the Los Cerritos Wetlands Complex began to undergo significant alterations due to cattle and beet farming, the demands of a growing population, and oil extraction. Oil was first discovered at the Seal Beach Oil Field in 1926. The development of oil production operations, paired with channelization of the San Gabriel River, resulted in substantial dredge and fill of the Los Cerritos Wetlands Complex. Today, nearly all of the program area has been converted from its historic wetland habitat, though a few remnant and degraded historic habitats remain. The most notable example of remaining historic habitat within the program area is the Steamshovel Slough, a fully tidal marsh connected to the Los Cerritos Channel that maintains high plant diversity and estuarine ecological communities.

2.4.2 Cultural History of the Los Cerritos Wetlands Complex

Archaeological evidence from the Channel Islands indicates that the first people migrated down the California Coast as early as 12,000 years ago (Cassidy et al. 2004; Erlandson et al. 2007), with permanent settlements established between 8,000 and 3,000 years ago (Douglass et al. 2015; Glassow et al. 1988; Grenda and Altschul 2002; Koerper et al. 2002; Macko 1998). From 1,000 years before present to approximately 1542 C.E., Los Angeles County and Northern Orange County were occupied by the Gabrielino people (named after the Spanish Mission where many of them were baptized). Approximately 50 major villages were located along the coast and inland prairies. The Gabrielino used the local wetlands, rivers, and streams to hunt and fish, to gather reeds and willows to build homes, and as a reliable water source (McCawley, 1996). Nearby Native American sites are known to be located at California State University Long Beach, Rancho Los Alamitos Historic Ranch, and Heron Pointe (California Coastal Commission, 2018).

The Los Cerritos Wetlands Complex has been identified by California Native American tribal members as a Tribal Cultural Landscape as part of government-to-government consultation with LCWA regarding the proposed program and as part of consultations related to the Los Cerritos Wetland Oil Consolidation and Restoration Project (see Section 2.4.4, *Los Cerritos Wetlands Oil Consolidation and Restoration Project*, for more detail on this project). Tribal members consulted believe the Tribal Cultural Landscape is eligible for listing in the National Register of Historic Places as a Tribal (or Traditional) Cultural Property (or TCP) – a type of significance that is often related to religious or ceremonial values because of unique landscape features, such as a mountain or bluff top, places with significant or special natural views, rivers and estuaries, or vegetation and wildlife, or areas with burials or religious artifacts/monuments. The wetlands are within walking distance to both *Puvungna* and *Motuucheyngna* village sites and served as an important resource to native peoples and was used both historically and in current times by native peoples. The California Coastal Commission has acknowledged the significance of this area as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project (State Clearinghouse No. 2016041083) (California Coastal Commission, 2018). Section 3.4, *Cultural Resources*, and Section 3.15, *Tribal Cultural Resources*, of this PEIR, provides a more exhaustive description of the cultural/tribal framework

2.4.3 Los Cerritos Wetlands Stewardship Program

The Los Cerritos Wetlands Stewardship Program² was created in 2009 by the LCWA to engage the public and allow volunteers to help the LCWA with managing and enhancing habitat that exists on LCWA property. The Los Cerritos Wetlands Stewardship Program Vision Plan prepared by the LCWA in 2018 identifies future restoration projects, including opportunities for improved public access.

2.4.4 Los Cerritos Wetlands Oil Consolidation and Restoration Project

A project-level EIR was prepared for the City of Long Beach to evaluate the environmental effects associated with the Los Cerritos Wetlands Oil Consolidation and Restoration Project (State Clearinghouse No. 2016041083). The project applicant, Beach Oil Minerals Partners (BOMP), proposes to consolidate existing oil operations and implement a wetlands habitat restoration project in portions of the North and Central Areas within the program area and on property that falls completely outside the program area. The EIR was certified by the City of Long Beach City Council on January 16, 2018. The Local Coastal Program Amendment associated with the Los Cerritos Wetlands Oil Consolidation and Restoration Project was approved by the California Coastal Commission (CCC) on August 8, 2018, with modifications to the amendment approved on October 2, 2018. The Coastal Development Permit was conditionally approved by the CCC on December 13, 2018. This PEIR relies on the technical analysis, impact discussion, and mitigation measures documented in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083) for portions of the program area. No new information of substantial importance or change in circumstance with the Los Cerritos Wetlands Oil Consolidation and Restoration Project requires re-evaluation of the analysis in that EIR. Appendix L provides a summary of the environmental effects and mitigation measures for the Los Cerritos Wetlands Oil Consolidation and Restoration Project.

The Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083) contains more detail and quantitative analysis than this program-level EIR because this EIR is evaluating the impacts associated with implementing the Los Cerritos Wetlands Restoration Plan, not a specifically designed project as is the case for the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The Los Cerritos Wetlands Oil Consolidation and Restoration Project was designed to be consistent with the goals and objectives of the Los Cerritos Wetlands Final Conceptual Restoration Plan.

2.4.4.1 Project Characteristics Not Evaluated in this PEIR

The environmental effects associated with the following project characteristics of the Los Cerritos Wetlands Oil Consolidation and Restoration Project are evaluated in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083) and will

² <http://intoloscerritoswetlands.org/wp-content/uploads/2015/12/LCWA-Stewardship-Program-Vision-Plan.pdf>

not be further evaluated in this PEIR (see **Figure 2-8**, *Los Cerritos Wetlands Oil Consolidation and Restoration Project*).

North Area

The Los Cerritos Wetlands Oil Consolidation and Restoration Project would involve removing the existing oil operations and associated facilities and implementing a wetlands habitat restoration project on the Northern and Southern Synergy Oil Field sites.

The first phase of the project would be focused on the 76.52-acre Northern Synergy Oil Field site, and provide the conditions necessary for the reestablishment of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions, including:

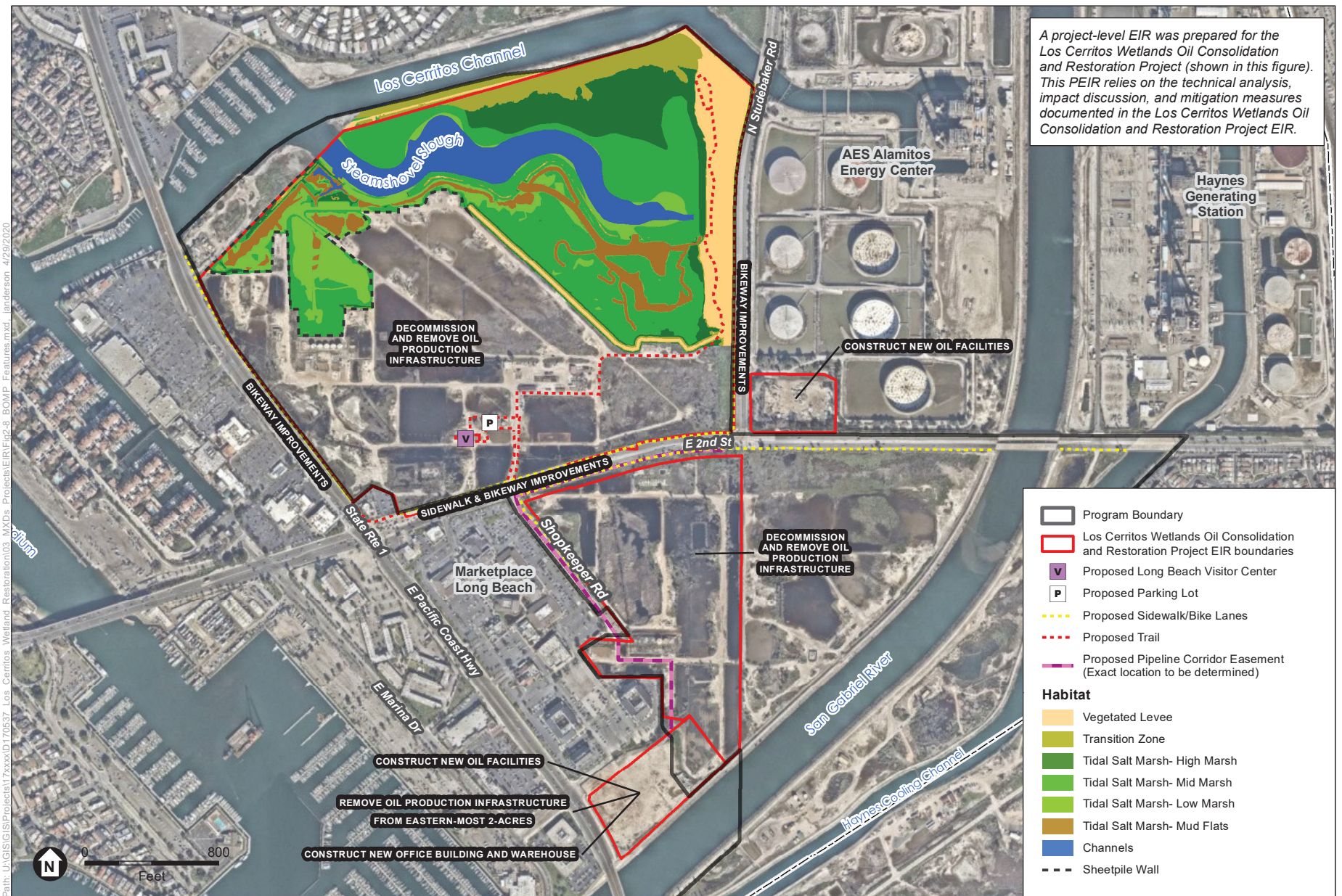
- Remediating any contaminated areas identified through sampling, and as required by permit, and restoring a natural wetland area that would be operated as a wetlands mitigation bank.³
- Constructing a new barrier consisting of sheet piles and earthen berms along the southern limits of the Northern Synergy Oil Field site;
- Establishing tidal channels, by means of grading, to convey tidal water from the Los Cerritos Channel/Steamshovel Slough to areas that currently lack tidal flows; and
- Removing segments of the existing berm and roads that currently separate Steamshovel Slough from non-tidal portions of the Northern Synergy Oil Field site.

The first phase of the project would also include work on the Southern Synergy Oil Field site, including relocating the existing office building on site to house the Long Beach Visitor Center, and construction of a parking lot, trail, overlook, sidewalk enhancements, and bikeway improvements.

The first phase of the project is expected to be implemented within 4 years of obtaining construction permits.

Within 20 years after obtaining Certificate of Occupancy for the new office on the Pumpkin Patch site, in the second phase of the project, all remaining oil operations would be removed and the 73.07-acre Southern Synergy Oil Field site may be restored to tidal salt marsh by breaching or lowering the earthen berm and removing the sheet pile wall.

³ Mitigation banking is the sale of credits for the preservation, enhancement, restoration or creation of a wetland, stream, or habitat conservation area which offsets, or compensates for, expected adverse impacts to similar nearby ecosystems. The approval and establishment of the mitigation bank, including the wetlands restoration plan that may be implemented, is subject to a separate regulatory process overseen by the interagency review team (IRT) consisting of State and federal resources agencies, and led by the U.S. Army Corps of Engineers.



SOURCE: Mapbox, LCWA, NOAA, ESA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-8
Los Cerritos Wetlands Oil Consolidation and Restoration Project

Central Area

An aboveground pipeline system and underground utility corridor would be constructed in the first phase of the project, along 2nd Street from Studebaker Road down to, and along, Shopkeeper Road on the Long Beach City Property site to the Pumpkin Patch site. On the Long Beach City Property, the tanks and 95 percent of all pipelines would be removed. Up to 95 percent of oil production infrastructure within the program area would be removed from the Pumpkin Patch site in the near term to allow for restoration. Sidewalks could be constructed along all parcel frontages.

Construction on the Pumpkin Patch site is expected to take 3 to 4 years, while construction of the pipeline system on the Long Beach City Property is expected to take 2 to 3 years.

Within 20 years from the New Occupancy Date, in the second phase of the project, oil operations would be removed from the Long Beach City Property site and contaminated areas would be remediated.

Outside the Program Boundary

Outside the program boundary, on the LCWA-owned property on the northeast corner of Studebaker Road and 2nd Street, oil processing facilities would be constructed after the site is remediated and graded. The facilities would include an elevated pipe rack, tank storage, well cellars, and an emergency flaring system. The Pumpkin Patch site outside the program area would be graded and new oil facilities would be constructed at the site. Oil facilities would include a tank storage area, well cellars, a water treatment system, and oil separation system. Additionally, a new office building and warehouse would be constructed on the Pumpkin Patch site. A bike station would be constructed adjacent to the Pumpkin Patch site. The first phase of the project is expected to be implemented within 2 years of obtaining construction permits. Potential environmental impacts to this activity are not analyzed under this PEIR, except to the extent these activities are reasonably anticipated future activities that may have a cumulative effect on activities within the program area (see Table 3-1 in Chapter 3, *Environmental Setting, Impacts, and Mitigation Measures*, which includes the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083), which is included as Cumulative Project No. 24).

2.5 Los Cerritos Wetlands Restoration Plan Goals and Objectives

The goals and objectives of the proposed program are presented below and are identical to the goals and objectives identified in the CRP (Moffatt & Nichol, 2015):

1. Restore tidal wetland processes and functions to the maximum extent possible.
 - a. Increase estuarine habitat with a mix of tidal channels, mudflat, salt marsh, and brackish/freshwater marsh and ponds.
 - b. Provide adequate area for wetland-upland ecotone and upland habitat to support wetlands.
 - c. Restore and maintain habitat that supports important life history phases for species of special concern (e.g., federal and state listed species), essential fish habitat, and migratory birds as appropriate.

2. Maximize contiguous habitat areas and maximize the buffer between habitat and sources of human disturbance.
 - a. Maximize wildlife corridors within the LCW Complex and between the LCW Complex and adjacent natural areas within the region.
 - b. Incorporate native upland vegetation buffers between habitat areas and human development to mitigate urban impacts (e.g., noise, light, unauthorized human encroachment, domestic animals, wastewater runoff) and reduce invasion by non-native organisms.
 - c. Design the edges of the LCW Complex to be respectful and compatible with current neighboring land uses.
3. Create a public access and interpretive program that is practical, protective of sensitive habitat and ongoing oil operations, economically feasible, and will ensure a memorable visitor experience.
 - a. Build upon existing beneficial uses.
 - b. Minimize public impacts on habitat/wildlife use of the LCW Complex.
 - c. Design interpretive concepts that promote environmental stewardship and the connection between the wetlands and the surrounding community.
 - d. Solicit and address feedback from members of the surrounding community and other interested parties.
4. Incorporate phasing of implementation to accommodate existing and future potential changes in land ownership and usage, and as funding becomes available.
 - a. Include projects that can be implemented as industrial operations are phased out and other properties are acquired over the near, mid, and long terms (next 10 years, 10–20 years, and 20+ years).
 - b. Investigate opportunities to restore levels of tidal influence that are compatible with current oil leases and neighboring private land holdings.
 - c. Remove/realign/consolidate existing infrastructure (roads, pipelines, etc.) and accommodate future potential changes in infrastructure, to the maximum extent feasible.
5. Strive for long-term restoration success.
 - a. Implement an adaptive management framework that is sustainable.
 - b. Restore habitats in appropriate areas to minimize the need for long-term maintenance activities that are extensive and disruptive to wildlife.
 - c. Design habitats that will accommodate climate changes (e.g., incorporate topographic and habitat diversity and natural buffers and transition zones to accommodate migration of wetlands with rising sea levels).
 - d. Provide economic benefit to the region.
6. Integrate experimental actions and research into the project, where appropriate, to inform restoration and management actions for this project.
 - a. Include opportunities for potential experiments and pilot projects to address gaps in information (e.g., effect of warm river water on salt marsh ecosystem) that are protective of sensitive habitat and wildlife and that can be used to adaptively manage the restoration project.
 - b. Include areas on the site, where appropriate, that prioritize research opportunities (such as those for adaptive management) over habitat sensitivities.

2.6 Land Use and Zoning Designations

The program area is located entirely within the California Coastal Zone, which means it is subject to the California Coastal Act and the City of Long Beach Local Coastal Program, adopted in 1980.

The Seal Beach General Plan designates the portion of the program area within Seal Beach city boundaries as Community Facilities, Industrial – Oil Extraction, Open Space, and Commercial Service (**Figure 2-9**, *General Plan Land Use Designations*).

According to the Seal Beach zoning map, and as shown in **Figure 2-10**, *Zoning Districts*, the properties within Seal Beach are zoned as Specific Plan Regulation, Open Space Natural, and Oil Extraction. The Hellman Ranch Specific Plan applies to the entire portion of the program area within the City of Seal Beach.⁴

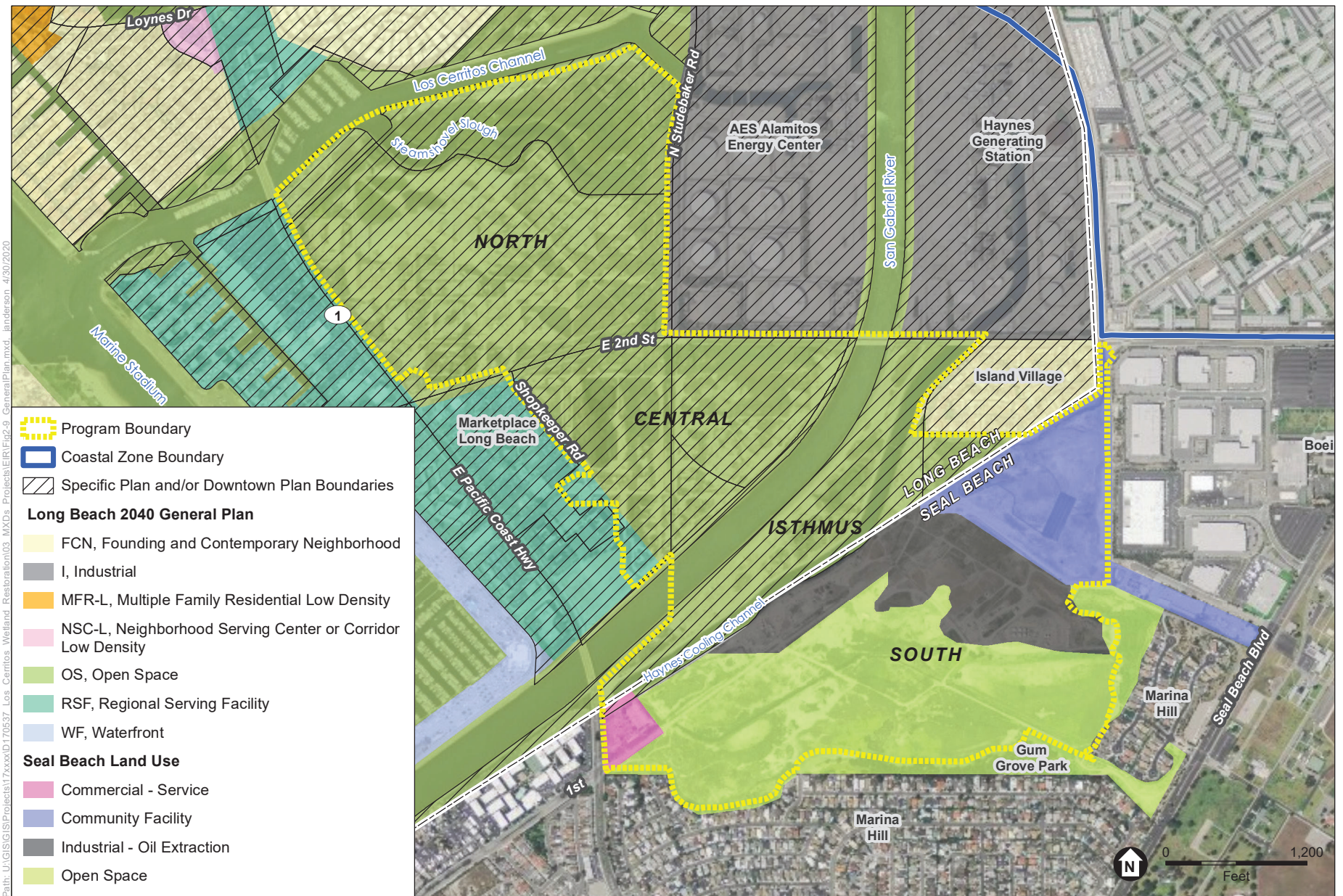
The City of Long Beach recently adopted the General Plan Land Use Element on December 2019. The currently adopted land use designations for the program area (as shown in Figure 2-9) are an Open Space (OS) Placetype with a Specific Plan Overlay, with the exception of the Pumpkin Patch site and a portion of the Long Beach City Property site, which have a Regional-Serving Facility (RSF) Placetype with a Specific Plan Overlay.

The properties within the City of Long Beach are subject to the South East Area Development and Improvement Plan (SEADIP). The City of Long Beach is in the process of replacing the SEADIP with the Southeast Area Specific Plan (SEASP) 2060, which would change the zoning of the program area and introduce new development standards (setbacks, densities, heights, buffers, etc.) and design guidelines.

2.7 Program Characteristics

As described in Section 2.2, *Program Area*, the program area consists of the South, Isthmus, Central and North areas (Figure 2-2). The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation or containment of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor center, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), modification of existing infrastructure and utilities, and integrating experimental actions and research into the proposed program.

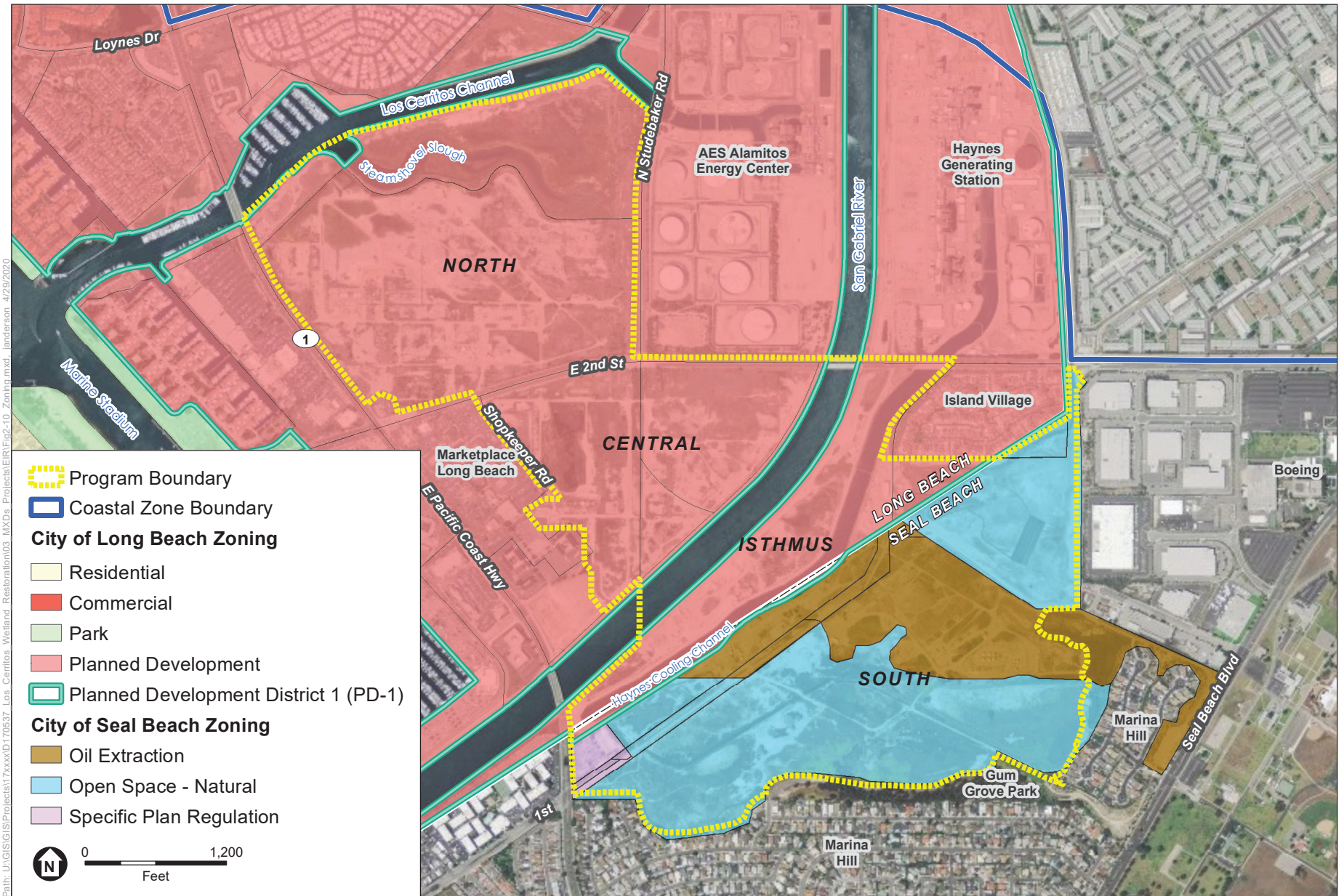
⁴ A specific plan is a document designed to implement the goals and policies of the General Plan. These plans will contain detailed development standards, distribution of land uses, infrastructure requirements, and implementation measures for the development of a specific geographic area.



SOURCE: Mapbox, LCWA, City of Long Beach, City of Seal Beach, ESA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-9
General Plan Land Use Designations



SOURCE: Mapbox, LCWA, City of Long Beach, City of Seal Beach

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-10
Zoning Districts

2.7.1 Overview of Common Program Features

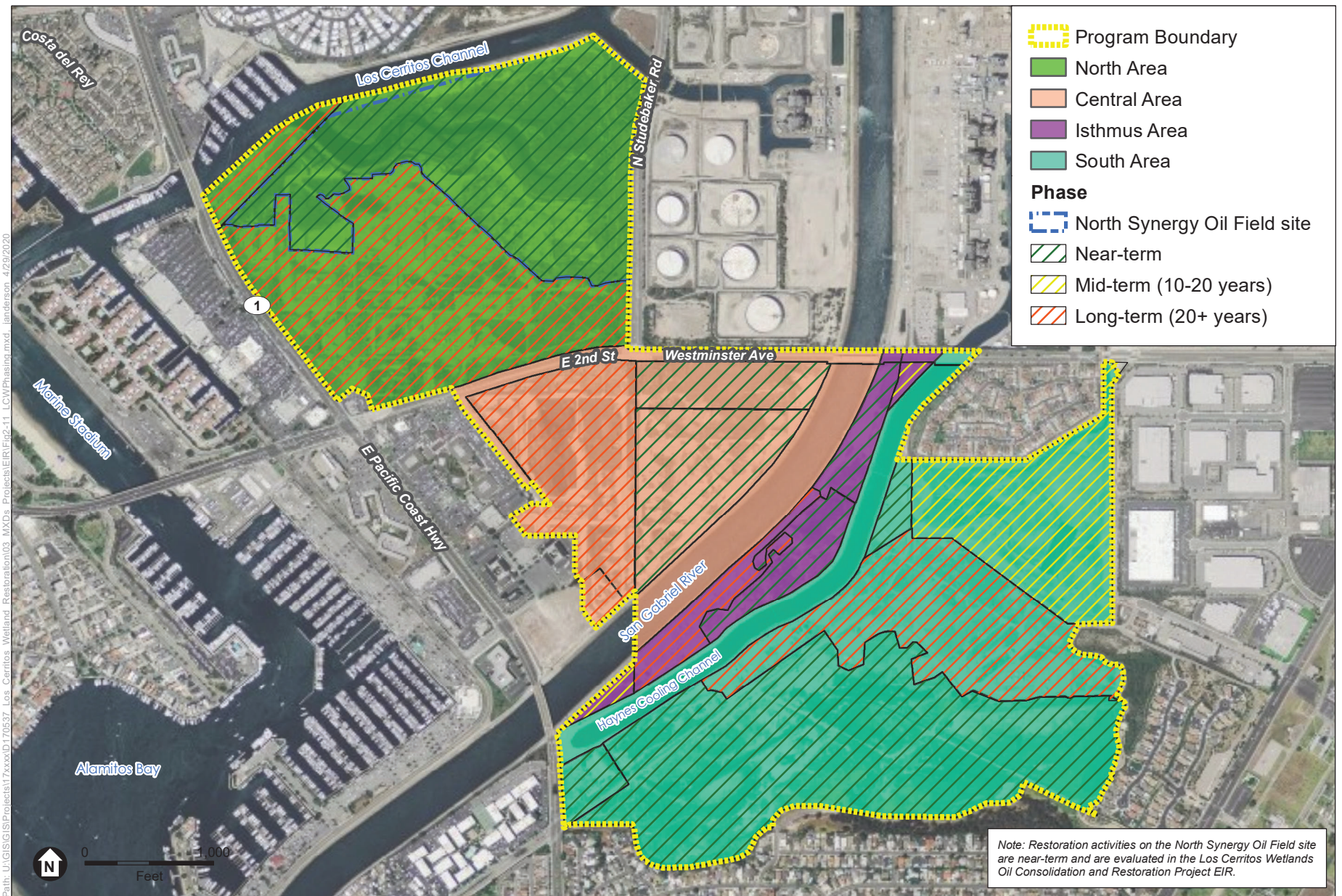
The description of each of the program areas is broken down into the following elements: phasing, ecosystem restoration, flood risk and stormwater management, public access and visitor facilities, and infrastructure and utility modification. An overview of each of these elements is provided below, followed by a more detailed description by program area. After the program area descriptions, at the end of Section 2.7, *Program Characteristics*, a description is provided for the entire program area regarding the implementation and restoration process (the construction phase), and the monitoring and adaptive management and operations and maintenance (the post-restoration phase).

2.7.1.1 Phasing

One of the Los Cerritos Wetlands Restoration Plan objectives (Objective #4, provided above in Section 2.5, *Los Cerritos Wetlands Restoration Plan Goals and Objectives*) is to incorporate phasing of implementation to accommodate existing and future potential changes in land ownership and usage, and as funding becomes available. The restoration activities would be phased over time as properties become available for acquisition by LCWA, as shown in **Figure 2-11**, *Los Cerritos Wetlands Restoration Plan Phasing*. The timing of construction at each site is dependent on multiple variables, including property transfers, removal of oil infrastructure, and related facilities, availability of funding, and permit approvals. Each phase of the proposed program will take multiple years to complete construction activities and with multiple years anticipated between each phase.

Construction on properties currently under the ownership of LCWA or in the process of being transferred to the LCWA is expected to occur in the **near term** (within approximately 10 years). Construction on properties that would be connected to or are associated with the decommissioning of the Haynes Cooling Channel or that may require more time than the near-term timeframe is expected to occur in the **mid term** (between approximately 10–20 years). The timing of the **long-term** phase depends on decommissioning of existing oil operations and could vary from around 20 years (where agreements are already in place) to much longer time frames. For oil operations that do not have agreements in place with LCWA, it is expected that overall levels of oil and natural gas production would continue until production decreases to below economically viable levels, after which oil production would stop production.

What is described in this PEIR is an approximation of the sequence of restoration that could occur; however, it is possible that a property identified as available for restoration in the mid term may not be restored until the long term, or a property identified as available for restoration in the mid term is available to be restored in the near term, etc. Restoration will not begin until a variety of actions are taken, including: preparation of project level restoration designs, completion of studies and analysis in support of design and permit approvals, acquiring project-level funding, acquiring permit approvals and associated CEQA clearance documents, amendments made with easement holders, and property transfers.



SOURCE: ESRI, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-11
Los Cerritos Wetlands Restoration Plan Phasing

2.7.1.2 Ecosystem Restoration

Ecosystem restoration includes actions that will restore more natural ecosystem processes (physical and biological) from disturbed habitats within the program area. Restoration of more natural ecosystem processes through actions like grading, altering tidal connections, and revegetation will lead to more extensive and higher functioning wetland, transition, and upland habitats. Habitat types that would be restored or enhanced within the program area include subtidal channels, intertidal salt marsh, salt marsh-upland transition zone, brackish marsh, native grassland, coastal sage scrub, and riparian scrub. Restored habitat distribution and acreages vary by program area and are described in more detail below.

Excavation of tidal channels to enhance tidal connection would require a balancing of temporary impacts to existing resources, which in most instances are moderately to substantially degraded wetlands, with maximizing the long-term functions of the areas receiving tidal exchange. To the extent feasible, tidal channels would avoid existing areas of pickleweed mats, Parish's glasswort patches and saltgrass flats and instead would be located in unvegetated flats and low elevation areas. In some areas it would not be possible to fully avoid existing vegetation while establishing the necessary elevations for the tidal channels.

The restored salt marsh areas would be re-vegetated through a combination of seeding and installation of nursery container stock. Restoration would include soil amendments (to enhance soil texture and nutrients), irrigation, and weed control. The salt marsh would support a mix of species such as Parish's glasswort, shoregrass, saltgrass, Pacific pickleweed, alkali heath, and Pacific cordgrass.

Revegetation activities in non-tidal areas would include removing or controlling invasive plant species and seeding/planting native plant species. Appropriate conditions will need to be restored in order to support target plant communities. A few important factors to consider will be hydrology, salinity, soil texture, and slope aspect. Invasive-nonnative plant species would be removed or treated according to the protocols described in Section 2.7.6.4, *Implementation Methods*. Additional details of implementing revegetation procedures are described in Section 2.7.6.4 under *Revegetation of Graded and Disturbed Areas*.

Intertidal areas with unrestricted connections to fully tidal waters will, over time with sea-level rise, experience an upward elevation shift in vegetation communities. In the shorter term, subtidal and low salt marsh areas would expand, and mid and high salt marsh areas would shrink. In the longer term, elevations that support intertidal communities at current sea level will be converted entirely to subtidal habitats. Gently sloped transition zone and low-lying upland habitats adjacent to today's salt marsh could support intertidal communities in the longer term.

Potential disturbances to sensitive habitats and species during operation of the proposed program would be minimized through effective design of public access areas to keep people on trails and out of habitat areas. The success of restoration efforts would be measured based on established performance criteria focusing on the abundance and diversity of native vegetation and the wildlife that use the Los Cerritos Wetlands Complex (see Section 2.7.7, *Monitoring and Adaptive Management*).

2.7.1.3 Flood Risk and Stormwater Management

Improving connection of wetlands to tidal flows to allow for habitat restoration would require changes to existing flood risk and stormwater management elements, and construction of new flood risk and stormwater management elements.

The proposed program would include modifications to Los Angeles County Drainage Area project structures within the program area by modifying the existing levee along the San Gabriel River, constructing new flood risk management structures (e.g., earthen levees and berms, or flood walls), restoring the wetland floodplain, constructing new water-control structures that allow for increased tidal connections, and constructing new stormwater management features (e.g., bioswales). The proposed program would also include modifications to existing operations and maintenance practices for flood risk and stormwater management structures.

The existing Los Angeles County Drainage Area project structures and facilities are maintained in such a manner and operated at such times and for such periods as necessary to obtain the maximum flood protection benefits (33 C.F.R. §208.10). The implementation of the proposed program would require revisions to the U.S. Army Corps of Engineers' OMRR&R Manual to reflect changes made to the existing Los Angeles County Drainage Area project structures and facilities within the program area.

2.7.1.4 Public Access and Visitor Facilities

Potential public access improvements and visitor amenities would include construction of new pedestrian trails, elevated perimeter pedestrian walkways, educational or interpretive features, viewing areas with overlooks, new and improved parking facilities, and visitor center. These improvements would develop and enhance public access, recreation, and educational opportunities within the program area, while balancing the need for protection of sensitive habitats.

2.7.1.5 Infrastructure and Utility Modification

Infrastructure and utility modifications include oil well and associated pipeline abandonment and relocation, and electric and water line relocation. These modifications would allow for increased connectivity of habitat restoration within the program area and protection of existing utilities that are not otherwise abandoned or relocated.

2.7.2 South Area

2.7.2.1 Phasing

Ecosystem restoration in the South Area would occur in three phases based on land and oil lease ownership. The near- and mid-term phases of the program in the South Area would be mostly focused on the South LCWA and State Lands Parcel sites and would provide the conditions necessary for the expansion of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions. Long-term phases of the program would be focused on the Hellman Retained site. The operations on the Los Alamitos Retarding Basin are proposed to be modified in the mid term, and no changes are proposed for the Los Alamitos Pump Station site, which was formerly restored as part of a mitigation project.

Near-term activities would include (**Figure 2-12, *Proposed South Area Near-Term Restoration***):

- Remediating soils (e.g., on-site treatment, excavation and removal, or cap in place) that have been impacted by oil operations;
- Grading the South LCWA site, including excavation to create channels and revegetation of native plants to support a diversity of marsh, transitional, and upland habitats;
- Constructing a new earthen berm or flood wall along the Hellman property boundary on the South LCWA site to protect the Hellman site from flooding;
- Raising 1st Street on the South LCWA site out of the floodplain by placing it on fill;
- Building a Seal Beach Visitor Center and associated parking on an existing raised building pad on the State Lands Parcel site;
- Removing the gate on the existing culvert connecting the South LCWA site to the San Gabriel River and removing the culverts under the former access roads. The existing culvert under 1st Street would either be improved or replaced with a bridge; and
- Restoring native grassland for raptor foraging habitat on South LCWA site.

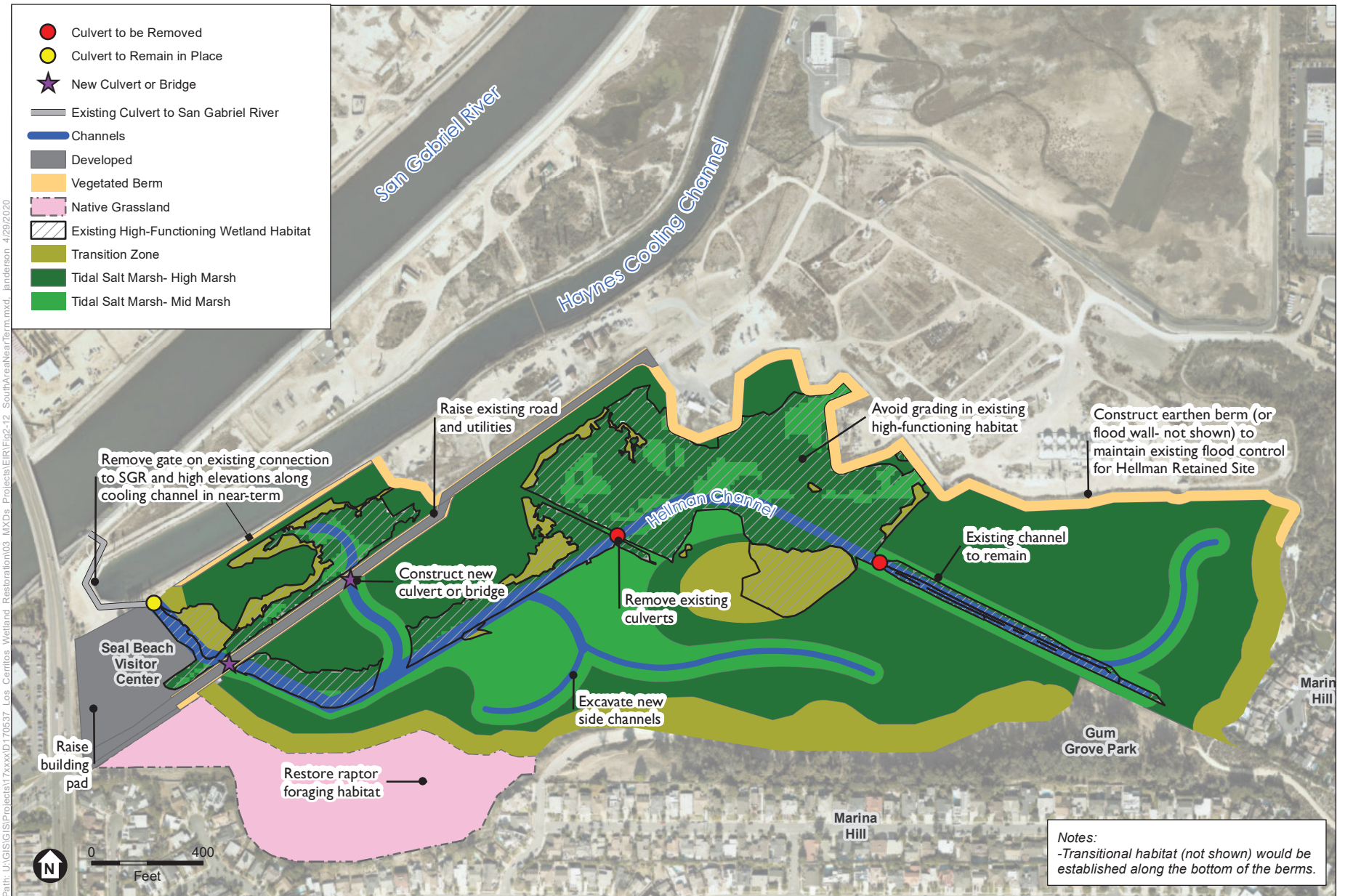
Mid-term activities would include (**Figure 2-13, *Proposed South Area Mid-Term Restoration***):

- Excavating a channel connecting the Hellman Channel directly to the Haynes Cooling Channel and lowering the berm along the Haynes Cooling Channel to increase the tidal range in the South LCWA site; and
- Modifying the Los Alamitos Retarding Basin operations to enhance the habitat value in the basin (e.g., change pumping operations to maintain ponding for shorter or longer time).

Long-term activities would include (**Figure 2-14, *Proposed South Area Long-Term Restoration***):

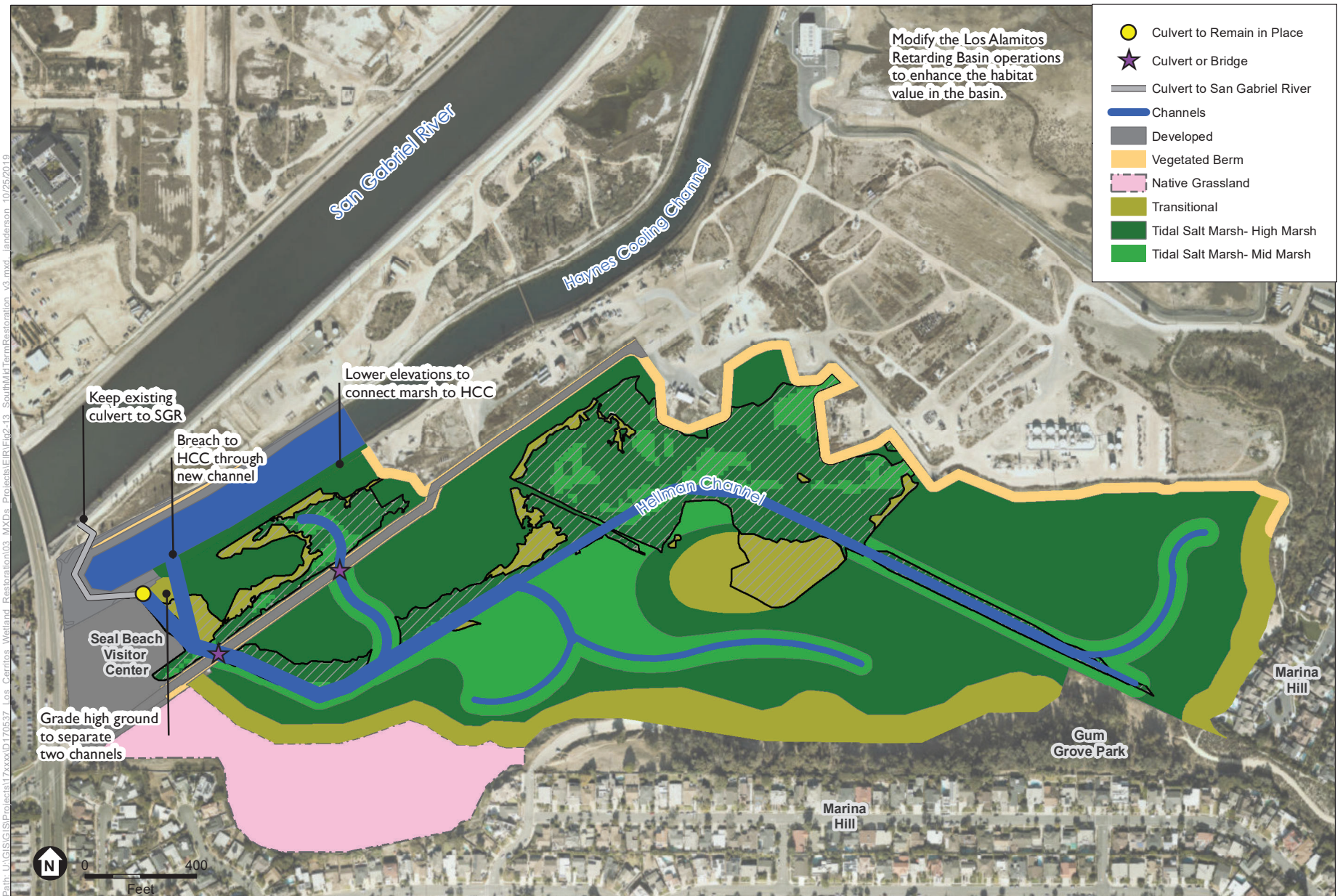
- Removing or consolidating oil operations on the Hellman Retained site to allow for restoration;
- Lowering, breaching, or removing the earthen berm or flood wall separating the South LCWA site and the Hellman Retained site
- Removing 1st Street (through the South LCWA site) and removing, lowering, or breaching the berm under the road.

Table 2-5, *South Area Phasing*, summarizes the activities associated with each phase.



SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR
Figure 2-12
 Proposed South Area Near-Term Restoration



SOURCE: ESRI, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-13
Proposed South Area Mid-Term Restoration

**TABLE 2-5
SOUTH AREA PHASING**

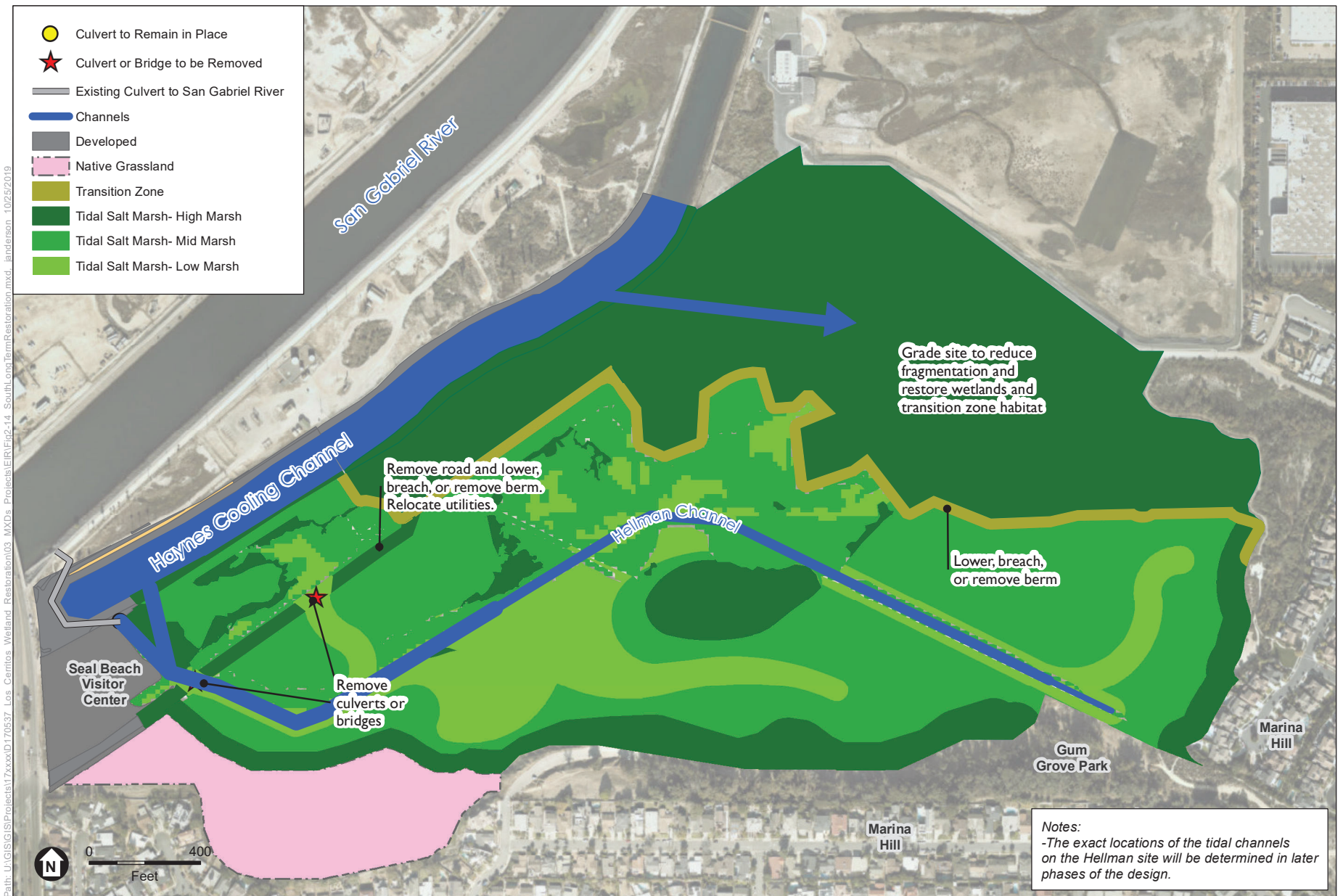
	Near Term (0–10 years)	Mid Term (10–20 years)	Long Term (20+ years)
Los Alamitos Pump Station Site	<ul style="list-style-type: none"> Previously restored 	n/a	n/a
South LCWA Site	<ul style="list-style-type: none"> Remediation of soils Grading of site to support habitat restoration Constructing an earthen berm or flood wall to protect Hellman Retained site Raising 1st Street Removing the gate on the Hellman Channel culvert to the San Gabriel River 	<ul style="list-style-type: none"> Excavating a channel to connect the Haynes Cooling Channel to the site Lower berm separating the Haynes Cooling Channel from the site 	<ul style="list-style-type: none"> Lower or breach earthen berm or remove flood wall to connect to Hellman Retained site Remove 1st Street and lower or breach berm
State Lands Parcel Site	<ul style="list-style-type: none"> Building a Seal Beach Visitor Center and associated parking facilities 	n/a	n/a
Haynes Cooling Channel	n/a	<ul style="list-style-type: none"> Channel is decommissioned 	n/a
Los Alamitos Retarding Basin Site	n/a	<ul style="list-style-type: none"> Operations of retarding basin are modified to enhance habitat 	n/a
Hellman Retained Site	n/a	n/a	<ul style="list-style-type: none"> Oil operations removed or consolidated to allow for restoration Remediation of soils Grading of site to support habitat restoration New tidal channel excavated to connect the Haynes Cooling Channel to the site

2.7.2.2 Ecosystem Restoration

Restored Habitats

Focused marsh and transitional wetland grading would occur across the South Area to lower the site to wetland elevations transitioning up to upland elevations along the southern and eastern borders of the South Area. Existing tidal salt marsh habitat would be avoided as much as possible. Tidal channels would be excavated in the near term on the South LCWA site and connected to the San Gabriel River through the existing culvert.

A 10-acre grassland, raptor foraging habitat is required to be restored in the southwest corner of the site. Target native grassland species would include Alkali sacaton (*Sporobolus airoides*), purple needlegrass (*Stipa pulchra*), and alkali ryegrass (*Elymus triticoides*). This area would meet the conditions for Heron Pointe, a previously approved residential development located outside the program boundaries south and east of the South Area per Coastal Development Permit 5-97-367-A1. The Coastal Development Permit's Amendment Staff Report (filed on September 12,



SOURCE: ESRI, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR
Figure 2-14
 Proposed South Area Long-Term Restoration

2000) requires the creation of 9.2 acres of suitable raptor foraging habitat to support various bird species which nest and/or forage in the South Area and within Gum Grove Park.

In the mid term, the site would be connected to the Haynes Cooling Channel, in addition to the existing culvert to the San Gabriel River, to increase the tide range at the site. Additionally, in the mid term the Los Alamitos Retarding Basin operations would be modified to enhance the habitat value in the basin. In the long term, a channel would be connected from the Haynes Cooling Channel into the Hellman Retained site, to bring tidal flows in.

Restoration habitat targets and acreages by phase are presented in **Table 2-6, *Post-Restoration Habitats and Acreages in South Area.***

**TABLE 2-6
POST-RESTORATION HABITATS AND ACREAGES IN SOUTH AREA**

Habitat Type	Existing Conditions	Near Term	Mid Term	Long Term
		Proposed Restoration	Proposed Restoration	Proposed Restoration
Wetlands^a	49.7	94.3	94.5	146.3
Transitional zone	4.3	15.5	15.5	19.2
Salt flat	2.9	0.0	0.0	0.0
Tidal salt marsh	0.0	0.0	66.5	115.0
Muted-tidal salt marsh	18.8	66.3	0.0	0.0
Non-tidal salt marsh	8.6	0.0	0.0	0.0
Non-native wetlands	6.6	2.0	1.9	0.0
Subtidal	8.5	10.5	10.7	12.1
Uplands	60.3	10.7	10.6	10.2
Native grassland	0.0	10.0	10.0	10.0
Native shrubland	7.1	0.5	0.5	0.2
Non-native upland	53.1	0.2	0.1	0.0
Managed Habitats	0.0	3.6	3.6	0.0
Vegetated berms	0.0	3.6	3.6	0.0
Non-Natural	51.1	52.5	52.4	4.9
Disturbed habitat	22.1	22.0	22.0	0.0
Developed (e.g., impervious surfaces)	29.1	30.5	30.4	4.9
Total^b	161	161	161	161

^a These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

^b Acreages do not include the Los Alamitos Pump Station site or the Los Alamitos Retarding Basin site. Acreages presented here assume the construction of an earthen berm, which has a slightly larger footprint than a flood wall

Hydrology and Grading

Marshplain Grading

Soil would be removed in focused areas to restore tidal wetlands near the Hellman Channel with transitional habitats between the wetlands and the new berm to be constructed along the Hellman Retained site boundary (transitional habitat not shown in figures) or the surrounding uplands. Areas of existing high-functioning wetland and transition habitat could be avoided. The soil removed would be used to construct the new berm, and the excess material would be used to build the levee system in the Central Area (Section 2.7.4, *Central Area*). In the near term, existing road and high elevations ranging from 8 to 14 feet mean lower low water (MLLW)⁵ on the South LCWA site would be graded down to marshplain elevation.

In the mid term, the existing high elevations along the south edge of the Haynes Cooling Channel on the South LCWA site would be lowered to allow sheet flow over the marshplain and into the South LCWA site. The Los Alamitos Retarding Basin site could be graded to enhance habitats, without affecting flood management functions and existing habitat mitigation.

Some of the elevations on the Hellman Retained site (5 to 11 feet MLLW) are already low enough and support high marsh species, but in the long term, some grading would be needed to expand areas of high marsh and improve tidal connections.

Perimeter Berm or Flood Wall

A perimeter earthen berm or flood wall would be constructed in the near term to maintain protection of the Hellman Retained site from seasonally high tide levels and storm events (**Figure 2-15, *Artistic Rendering of South Area Perimeter Berm and Flood Wall***). Soil excavated from the tidal channels or marshplain grading would be used to construct the berm (approximately 16,000 cy would be required).

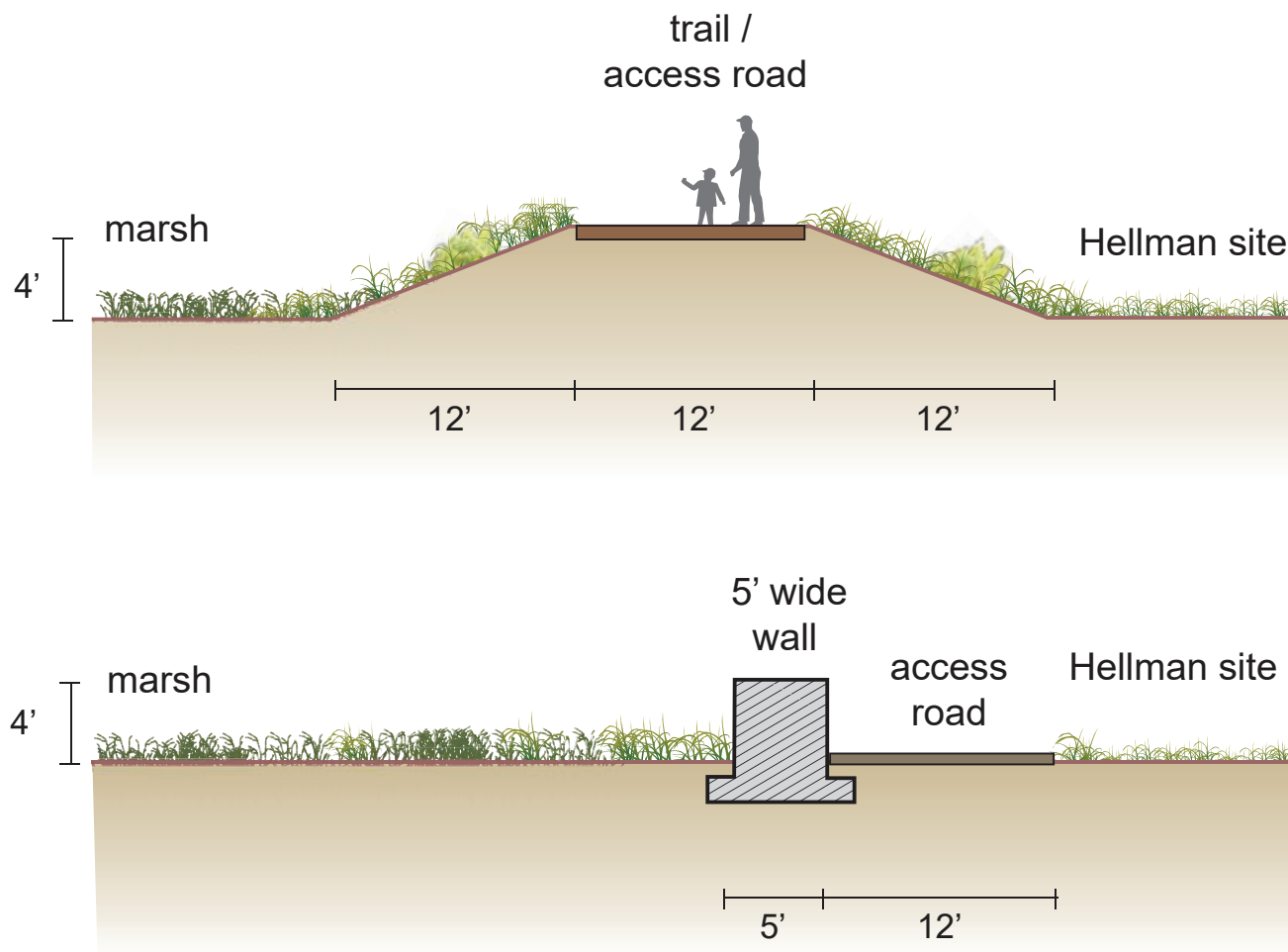
The berm or wall crest elevation would be set to 10 feet NAVD,⁶ or roughly 4 feet above the marshplain, to allow for higher water levels while maintaining the existing level of inundation protection for the Hellman Retained site. If an earthen berm is used, it would be constructed with a top width of 12 feet to accommodate an access road for maintenance and a public access trail, and side slopes of 3:1 horizontal to vertical (H:V) down to the marsh and Hellman Retained site. If a flood wall is used, the wall would be 5 feet wide/thick with a 12-foot access road for maintenance behind it.

Raised Road

An additional berm would be constructed in the near term along 1st Street to raise the existing road onto the berm so that it is above the marshplain and to maintain the existing access easement for the Hellman Retained site. The berm would be constructed with a top width of 30 feet and side slopes of 3:1 H:V down to the marsh on either side.

⁵ Mean lower low water is the average of the lowest tide every day over a 13-year period.

⁶ The North American Vertical Datum of 1988 (NAVD) is the vertical elevation control datum established for vertical control surveying in the United States and accounts for the fact that mean sea level is not the same equipotential surface at all tidal bench marks.



SOURCE: ESA, 2019

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Figure 2-15
Artistic Rendering Berms

Tidal Channels

In the near term, new tidal channels would be excavated off of the Hellman Channel on the South LCWA site to create a sinuous and branching network of tidal channels through the wetlands. The existing channel would connect to the existing San Gabriel River culvert and would continue to be subtidal. The smaller channels throughout the rest of the marsh would be intertidal and would drain at low tide. The larger channels would branch into smaller distributary channels.

In the mid term, a short channel would be excavated to connect the existing main channel to the Haynes Cooling Channel. The existing culvert and channel connection would remain.

In the long term, a new channel network would be excavated from the Haynes Cooling Channel into the Hellman Retained site.

Water-Control Structures

In the near term, two of the existing culverts along the Hellman Channel would be improved to enhance tidal connection to the southern and eastern portions of the South LCWA site. The existing culvert under 1st Street would be improved or replaced with a bridge once the road is raised, and a second culvert or bridge would be installed through the road berm as well to connect the marsh west of the road with the marsh east of the road. The existing culvert connecting the main channel to the San Gabriel River would be improved, as needed, and the flap gate on the culvert would be removed.

Berm or Flood Wall Removal

The earthen berm or flood wall constructed in the near term would be lowered, breached, or removed to create marsh and increase connectivity to the Hellman Retained site once that site has been restored in the long term. The 1st Street berm would also be lowered or breached once the road is removed.

2.7.2.3 Flood Risk and Stormwater Management

Perimeter Berm or Flood Wall

To increase tidal flows to the site, the gate on the existing culvert connecting the South LCWA site to the San Gabriel River would be removed. To prevent flooding of the Hellman Retained site, a perimeter berm or flood wall would be constructed along the Hellman Retained site and South LCWA site boundary and tied into areas of high ground to maintain the existing level of flood risk protection.

Stormwater Management

In the near term, new stormwater basin or bioswales would be constructed to function as a water quality treatment measure for the stormwater runoff from the new Seal Beach Visitor Center and associated parking.

2.7.2.4 Public Access and Visitor Facilities

The proposed program would develop and improve public access, recreation, and interpretative opportunities within the South Area in the near term, as shown in **Figure 2-16, *Proposed South Area Near-Term Public Access***, and in the long term, as shown in **Figure 2-17, *Proposed South Area Long-Term Public Access***.

Visitor Center and Parking

A new Seal Beach Visitor Center would be constructed on the existing raised building pad at the southeast corner of the San Gabriel River Trail and PCH. Parking would be provided along 1st Street adjacent to the Seal Beach Visitor Center for employees and visitors. An additional existing parking lot would be available at the western end of the Gum Grove Trail. The Seal Beach Visitor Center would serve as the main access point to the Isthmus and South Areas, with trail connections to Callaway and Zedler Marshes to the north, and to Gum Grove Park and the Hellman Ranch Trail to the east.

Trails and Overlooks

A new restricted trail would be constructed through the raptor habitat on the South LCWA site in the near term. The trail would connect Gum Grove Park to the existing San Gabriel River Trail, fishing area, and trails on the Isthmus area. Initially this trail would be restricted to docent-led tours until habitat areas are established and a management plan is approved. A viewpoint would be constructed in the raptor habitat area.

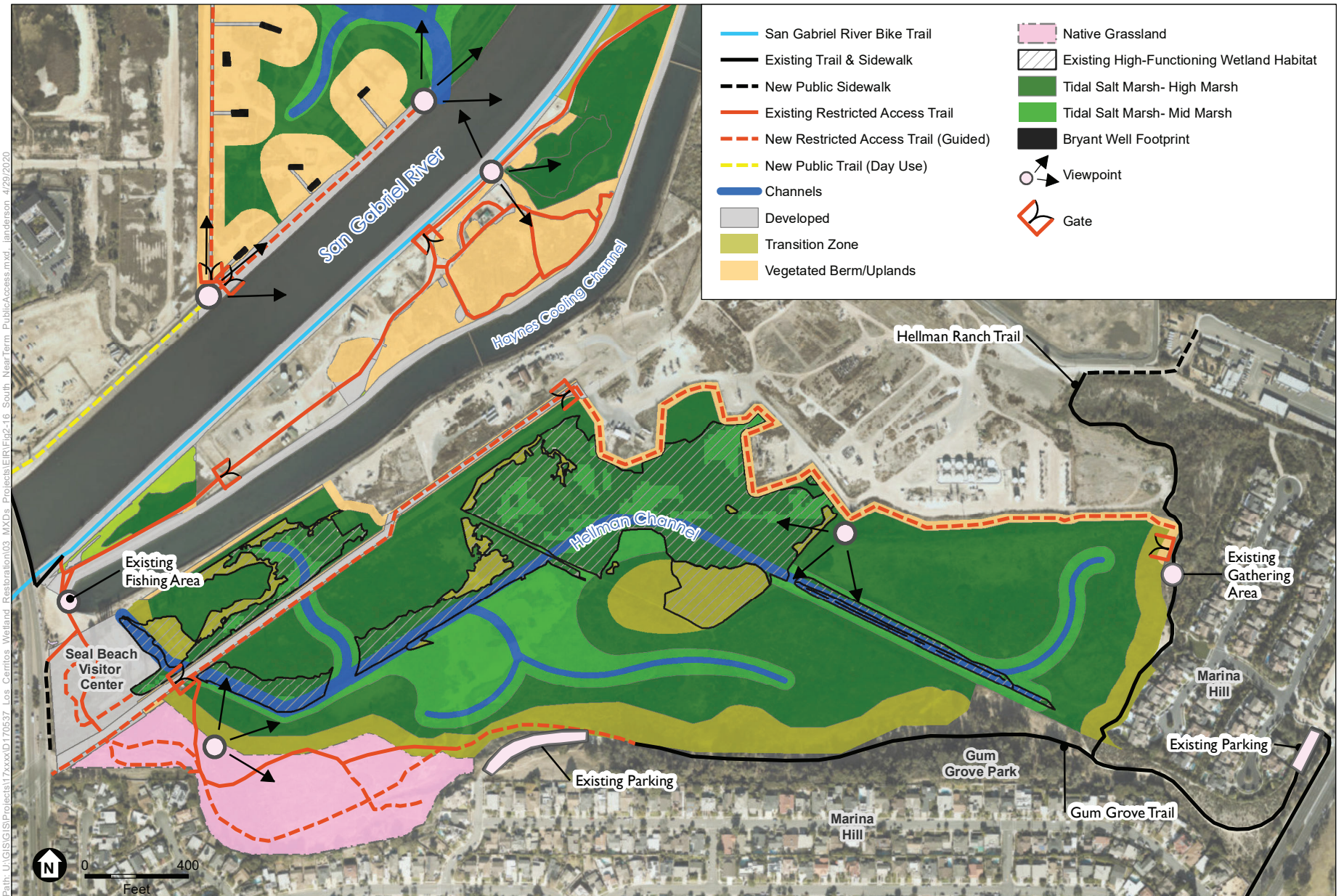
Another restricted trail would be constructed along the top of the new berm, connecting with 1st Street on the west and Gum Grove Trail on the east. If the perimeter flood wall is constructed instead of the berm, public access would be reduced. A viewpoint would be constructed along the new berm. This trail would be restricted to docent-led tours and maintenance access. In the long-term phase, this trail would be removed to allow for full restoration of the South Area.

The existing fishing area at the Haynes Cooling Channel would be retained. Public access along PCH would be improved by the addition of sidewalks between 1st Street and the San Gabriel River Trail, and improvements to formalize parking at the fishing area.

2.7.2.5 Infrastructure and Utility Modification

In the near term, the existing road (1st Street) through the marsh would be raised on a berm to move it out of the restored marsh floodplain. The City of Seal Beach is planning to replace the water line within the road, which could be done at the same time as the road upgrade. The utility poles supporting the power lines along the road would likely need to be improved (e.g., relocated, heightened) as part of the raising of the road. Preferably the power lines could be replaced underground.

In the long term, the oil wells and associated oil production infrastructure on the Hellman Retained site would need to be decommissioned and removed before restoration can occur. Because there are no agreements in place between the oil operators and LCWA in the South area, it is expected that overall levels of oil and natural gas production would continue until production



SOURCE: ESRI, LCWA, ESA

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Figure 2-16
Proposed South Area Near-Term Public Access



SOURCE: ESRI, LCWA, ESA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-17
Proposed South Area Long-Term Public Access

decreases to below economically viable levels, after which oil production would stop. When the owner/operators of those oil operations elect to change or close those operations, the changes would be analyzed under separate CEQA documents. The work would involve plugging and abandoning oil wells and is discussed in more detail under the heading Oil Well Abandonment in Section 2.7.6.4 *Implementation Methods*. Additionally, 1st Street would be removed, to allow for restoration of the berm. The water line and power lines would be relocated off site.

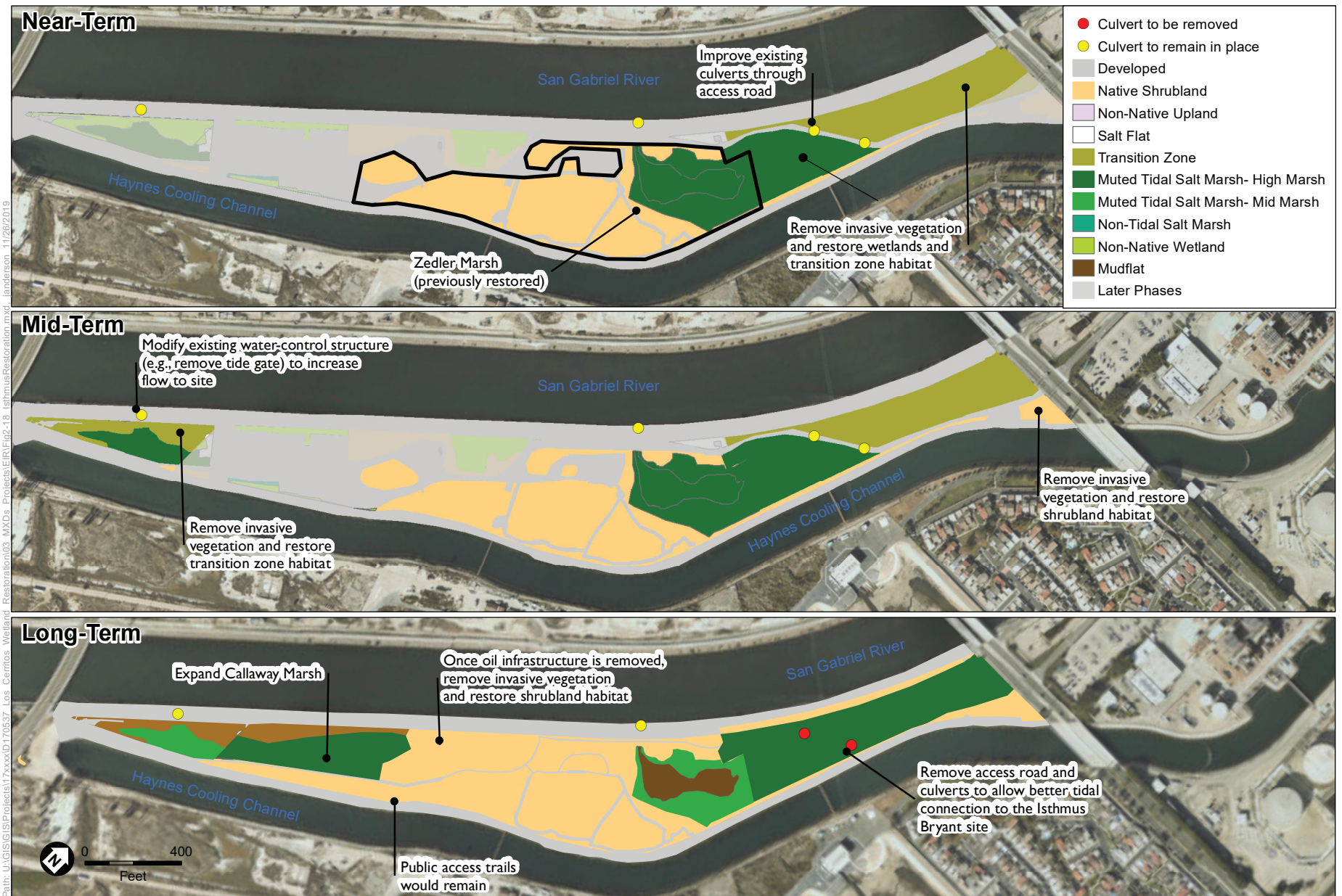
2.7.3 Isthmus Area

2.7.3.1 Phasing

In the near term, the proposed program would extend the restoration currently present on the Zedler Marsh site north into the Isthmus Bryant site and the portion of the DWP site west of the gas access road (**Figure 2-18, *Proposed Isthmus Area Restoration***). The Callaway Marsh site and the rest of the DWP site would be enhanced in the mid term, once the Haynes Cooling Channel is decommissioned by LADWP and no longer in use for the Haynes Generating Station. In the long term, the oil operations on the Isthmus LCWA site would be removed or consolidated off site to allow for restoration once the oil operations are no longer active. **Table 2-7, *Isthmus Area Phasing***, summarizes the activities associated with each phase.

**TABLE 2-7
ISTHMUS AREA PHASING**

	Near Term (0–10 years)	Mid Term (10–20 years)	Long Term (20+ years)
Zedler Marsh Site	<ul style="list-style-type: none"> Previously restored with ongoing restoration activities per the Stewardship Vision Plan 	n/a	n/a
Isthmus Bryant Site	<ul style="list-style-type: none"> Limited grading of site to support habitat restoration and provide tidal connection to Zedler Marsh Removal of invasive species and planting of native vegetation 	n/a	<ul style="list-style-type: none"> Removal of access road and culverts to allow better tidal flow to the north
DWP Site	<ul style="list-style-type: none"> Removal of invasive species and planting of native vegetation west of the gas access road 	<ul style="list-style-type: none"> Removal of invasive species and planting of native vegetation east of the gas access road 	<ul style="list-style-type: none"> Removal of access road to reduce habitat fragmentation
Callaway Marsh Site	n/a	<ul style="list-style-type: none"> Limited grading of site to support habitat restoration Removal of flap gate on culvert connecting site to San Gabriel River Removal of invasive species and planting of native vegetation 	n/a
Isthmus LCWA Site	n/a	n/a	<ul style="list-style-type: none"> Oil operations removed or consolidated to allow for restoration Remediation of soils Limited grading of site to support habitat restoration Removal of invasive species and planting of native vegetation



SOURCE: Mapbox, LCWA, NOAA, ESA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-18
Proposed Isthmus Area Restoration

2.7.3.2 Ecosystem Restoration

Restored Habitats

In the near term, the Isthmus Bryant site would be graded in limited places to eliminate habitat fragmentation and to create small tidal creeks. The area southeast of the gas access road would be restored to muted tidal salt marsh habitat, while the habitat northwest of the gas access road (on both the Isthmus Bryant and DWP sites) would be restored to transitional habitat. Community volunteers through the LCWA Stewardship Program would be involved in revegetation activities and invasive plant species removal on this site.

In the mid term, wetland enhancements in Callaway Marsh would include invasive vegetation removal and native vegetation restoration in the wetlands and transition zone along the edges of the site, and include modifications to the existing water-control structure (e.g., removing the existing tide gate) to increase the tidal flow to the Callaway Marsh site. Grading would take place in locations as necessary to maximize tidal wetland, while preserving areas for transitional habitat. On the DWP site east of the oil operations access road, invasive vegetation would be removed and native shrubland would be restored.

In the long term, restoration of the Isthmus LCWA site would involve invasive vegetation removal and native vegetation restoration. The southwest portion of the site has lower elevations which would support muted tidal salt marsh vegetation, while the northern portion of the site would support native shrubland habitat. The gas access road through the Isthmus Bryant site would be removed in order to provide better hydrologic connections between Zedler Marsh and the vegetation in the north.

Restoration habitat targets and acreages by phase are presented in **Table 2-8, *Post-Restoration Habitats and Acreages in Isthmus Area.***

Hydrology and Grading

Marshplain Grading

In the near term, there may be minimal grading activity on the Isthmus Bryant site and the western portion of the DWP site to allow for current high tides to flow from Zedler Marsh further north towards 2nd Street. The existing culverts under the oil operations access road would remain in place to provide some tidal connection to the area north of the road.

In the mid term, some grading in areas of ruderal upland around the perimeter of the Callaway Marsh site (8 to 10 feet MLLW) would be conducted to expand the marsh and increase areas that would be inundated by tidal waters, while maintaining transitional and upland habitat.

Depending on the rate of sea-level rise when the long-term restoration is implemented, the elevations on the Isthmus LCWA site (6 to 15 feet MLLW) may be appropriate for both upland and muted tidal salt marsh habitats in the west near Callaway Marsh. Some grading would be needed to eliminate habitat fragmentation caused by the existing development.

**TABLE 2-8
POST-RESTORATION HABITATS AND ACREAGES IN ISTHMUS AREA**

Habitat Type	Existing Conditions	Near Term	Mid Term	Long Term
		Proposed Restoration	Proposed Restoration	Proposed Restoration
Wetlands^a	10.5	10.7	10.7	13.5
Transitional zone	0.0	3.0	3.8	2.2
Salt flat	1.9	0.2	0.2	0.0
Muted-tidal salt marsh	3.3	5.3	5.2	11.2
Non-tidal salt marsh	3.1	0.1	0.1	0.0
Non-native wetlands	2.2	2.2	1.4	0.0
Uplands	7.7	7.7	8.0	11.7
Native shrubland ^b	7.3	7.7	8.0	11.7
Non-native upland	0.4	0.0	0.0	0.0
Non-Natural	9.8	9.7	9.7	2.9
Developed (e.g., impervious surfaces)	9.8	9.7	9.7	2.9
Total^c	28	28	28	28

^a These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

^b Under existing conditions, this category includes recently restored shrubland that is still being weeded and irrigated. However, it is expected that this habitat will evolve to a natural stand in the future.

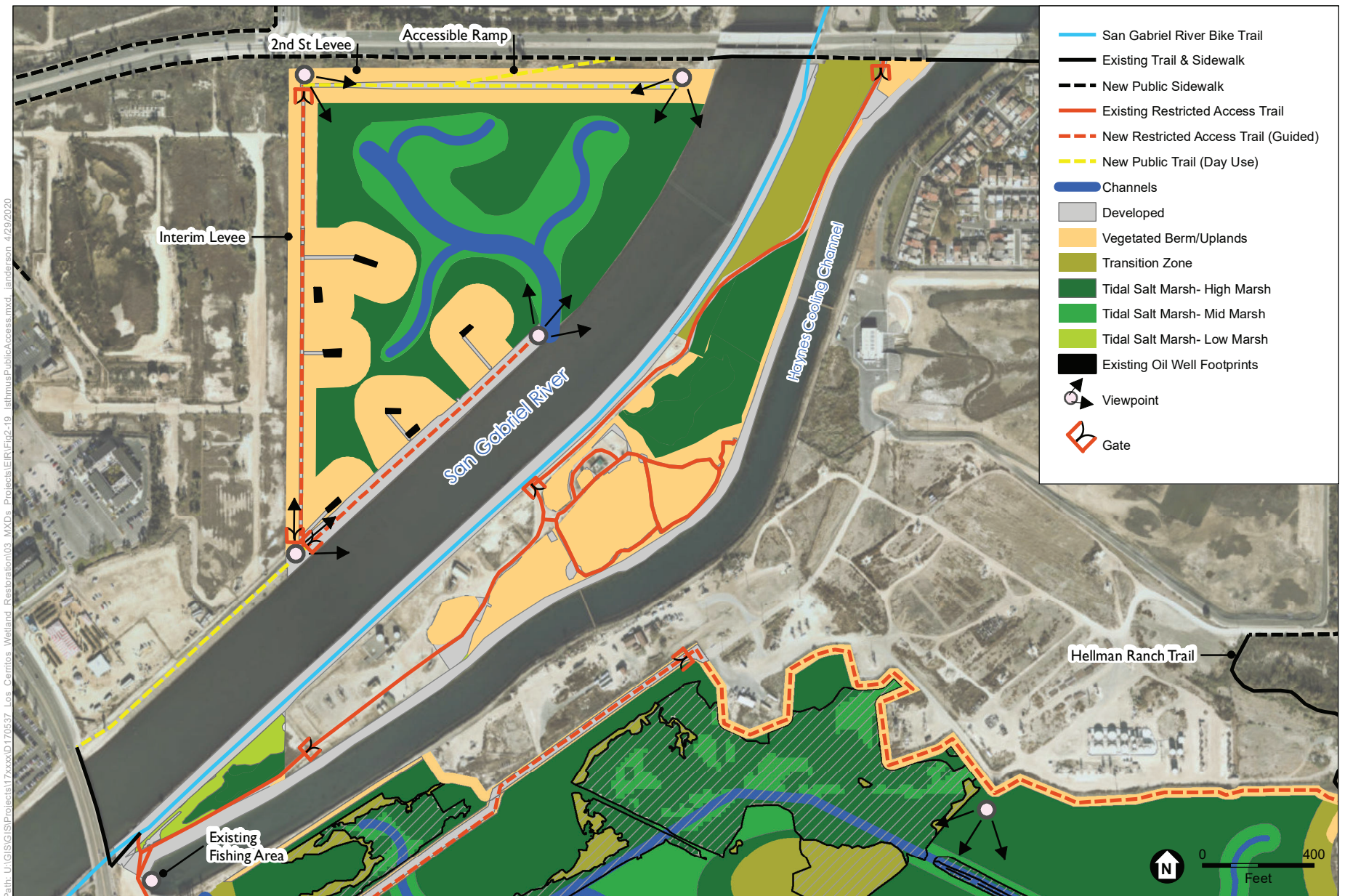
^c Acreages do not include the Los Alamitos Pump Station site or the Los Alamitos Retarding Basin site. Acreages presented here assume the construction of an earthen berm which has a slightly larger footprint than a flood wall

2.7.3.3 Flood Risk and Stormwater Management

The existing culverts connecting the San Gabriel River to the Zedler and Callaway Marsh sites would be maintained, so no change to the flood risk or stormwater management is anticipated. The increased water levels in Callaway Marsh once the existing gate is removed would require a self-regulating tide gate to limit high water levels or grading to raise the high ground around the site.

2.7.3.4 Public Access and Visitor Facilities

No new public access or visitor facilities are proposed for the Isthmus Area beyond possible installation of additional interpretive signage (**Figure 2-19, Proposed Isthmus Area Public Access**). Public access could be improved in the near term by opening the gate along the San Gabriel Trail, and scheduling docent-led tours or walks at Zedler Marsh. Once the Seal Beach Visitor Center and parking lot are constructed as part of restoration of the South Area, the existing road that connects Zedler Marsh to Callaway Marsh and the PCH would provide a new restricted access trail connection between the Seal Beach Visitor Center and Zedler Marsh.



SOURCE: NOAA, ESA, LCWA

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Figure 2-19
Proposed Isthmus Area Public Access

2.7.3.5 Infrastructure and Utility Modification

No new infrastructure or modifications to utilities are proposed for the Isthmus Area in the near- and mid term. In the long term, oil wells and associated oil production infrastructure on the Isthmus LCWA site would need to be decommissioned and removed before restoration can occur. Because there are no agreements in place between the oil operators and LCWA in the Isthmus area, it is expected that overall levels of oil and natural gas production would continue until production decreases to below economically viable levels, after which oil production would stop. When the owner/operators of those oil operations elect to change or close those operations, the changes would be analyzed under separate CEQA documents. The work involved in abandoning oil wells is discussed under the heading Oil Well Abandonment in Section 2.7.6.4, *Implementation Methods*.

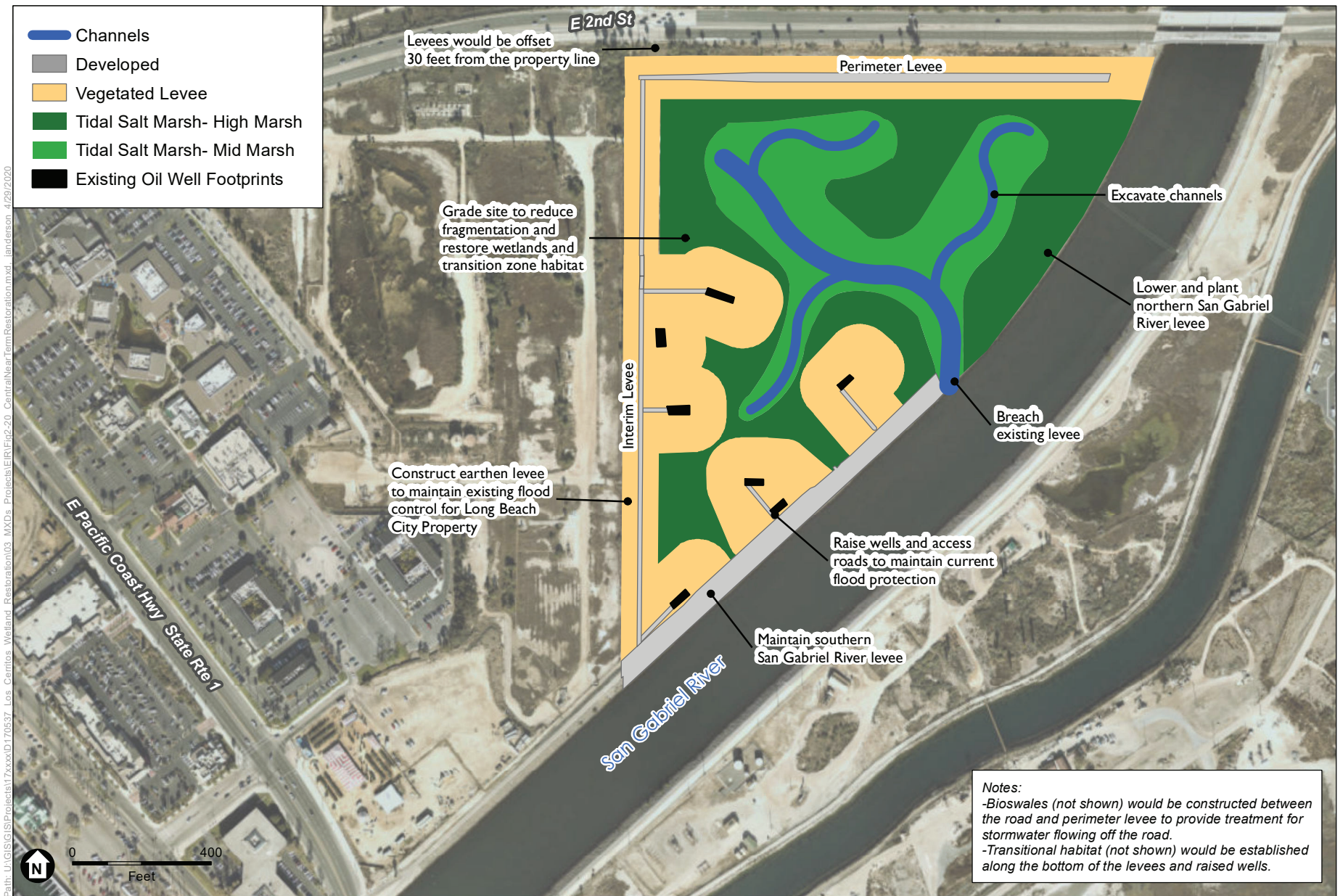
2.7.4 Central Area

2.7.4.1 Phasing

Ecosystem restoration in the Central Area would occur in two phases based on land and oil lease ownership. The Central LCWA site is available for restoration immediately, and discussions between Bryant Dakin, LLC and the LCWA on acquisition of the Central Bryant site for restoration are on-going. The program assumes that both of these properties would be available for restoration in the near term, and the existing oil operations on the Central LCWA site operated by Signal Hill Petroleum, Inc. would be protected in place by proposing to raise the wells out of the floodplain. The Long Beach City Property site and the Pumpkin Patch site are part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project (see Section 2.4.4, *Los Cerritos Wetlands Oil Consolidation and Restoration Project*) and would be available for restoration in the long term.

The near-term phase of the program would be focused on the Central LCWA and Central Bryant sites and would provide the conditions necessary for the reestablishment of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions (**Figure 2-20, Proposed Central Area Near-Term Restoration**). Near-term activities would include:

- Relocating or modifying oil infrastructure and remediation of soils on the Central LCWA site;
- Grading of the sites, including channels, and revegetation of native plants to support a diversity of salt marsh species;
- Removing segments of the existing levee (e.g., breaching the levee and/or lowering a segment) that currently separates the San Gabriel River from non-tidal portions of the Central LCWA and Central Bryant sites;
- Constructing a new earthen levee (Perimeter Levee) along 2nd Street from the San Gabriel River to the intersection with Studebaker Road to protect areas to the north from flooding;
- Constructing a new interim earthen levee (Interim Levee) along the western boundary of the Central LCWA site to protect the areas to the west from flooding and to provide continued access to the wells on the Central LCWA site;
- Providing flood protection for the existing wells on the Central LCWA site by proposing to raise the well pads out of the floodplain; and
- Constructing public trails on levees, including accessible ramps, and viewpoints.



SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR
Figure 2-20
 Proposed Central Area Near-Term Restoration

In the long term, the Long Beach City Property site and the Pumpkin Patch site would be restored to tidal salt marsh, including (**Figure 2-21, Proposed Central Area Long-Term Restoration**):

- Grading the Long Beach City Property site, including channels, to support a diversity of salt marsh species;
- Removing the northern segment of the Interim Levee on the Central LCWA site to connect the restored habitats on the Central LCWA site to the non-tidal portions of the Long Beach City Property site;
- Constructing a new earthen levee (Perimeter Levee) along 2nd Street between the intersection with Studebaker Road to Shopkeeper Road on the Long Beach City Property site and then along Shopkeeper Road to the existing San Gabriel River levee on the Long Beach City Property and Pumpkin Patch sites to protect areas to the north and west from flooding; and
- Constructing public trails on levees, accessible ramps, stairs, and viewpoints.

Table 2-9, Central Area Phasing, summarizes the activities associated with each phase.

Impacts associated with habitat restoration on the Long Beach City Property and Pumpkin Patch sites will be evaluated under this PEIR. See the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083) and CCC Staff Report conditions for impacts associated with soil remediation, oil consolidation, and construction of the new pipeline system and utility corridor.

2.7.4.2 Ecosystem Restoration

Restored Habitats

The proposed program would restore connectivity of the San Gabriel River with a broader wetland floodplain across the Central LCWA, Central Bryant, and Long Beach City Property sites by removing segments of the existing levees on the north bank of the river and creating a tidal channel network. Sub-tidal and intertidal channels would extend from the San Gabriel River into the vegetated tidal wetlands, providing habitat diversity and tidal circulation. Grading would occur across the Central Area to lower the elevation of upland roads and pads to wetland elevations, if needed. The San Gabriel River Levee north of the breach would be lowered to create additional habitat.

The Perimeter Levee would slope from upland down through transitional marsh habitat (area not shown in Figure 2-22)⁷ to salt marsh at a 3:1 H:V slope (**Figure 2-22, Artistic Renderings of Central Area Perimeter Levee**, top cross-section).

In the long term, the area west of the Perimeter Levee would be restored to brackish marsh by focusing local run-off into this location and removing invasive plants.

Restoration habitat targets and acreages by phase and option are presented in **Table 2-10, Post-Restoration Habitats and Acreages in Central Area**.

⁷ There would be a roughly 6-foot strip of transitional habitat along the Perimeter Levee totaling 0.7 acres



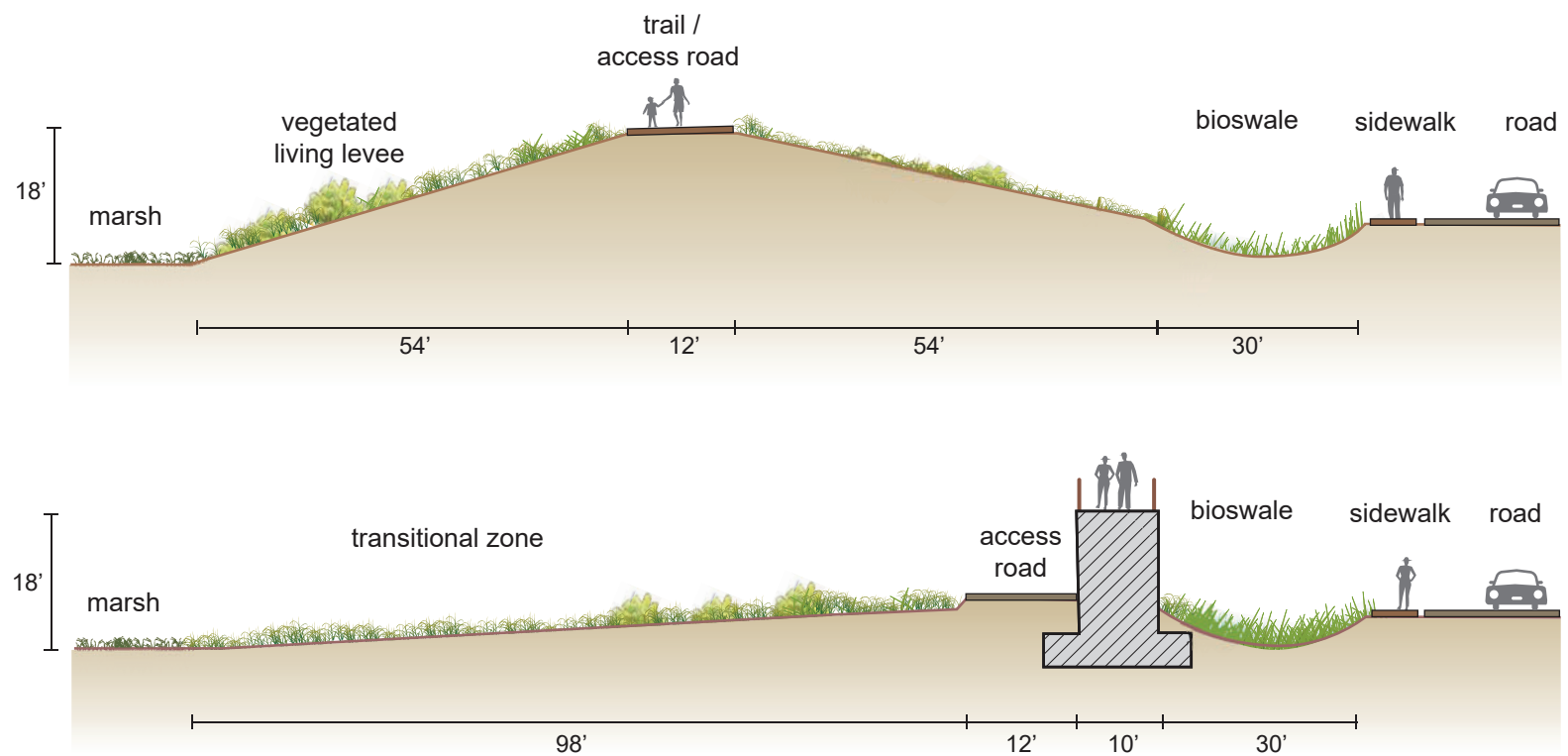
SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR
Figure 2-21
 Proposed Central Area Long-Term Restoration

**TABLE 2-9
CENTRAL AREA PHASING**

	Near Term (0–10 ears)	Mid Term (10–20 years)	Long Term (20+ years)
Central LCWA Site and Central Bryant Site	<ul style="list-style-type: none"> • Remediation of soils and relocation or modifying oil infrastructure • Grading of site to support habitat restoration • Construction of earthen levee to protect Long Beach City Property site (Interim Levee) and 2nd Street (Perimeter Levee) • Raising existing wells to protect them • Breaching the San Gabriel River Levee and reconnecting the river to the restored marsh • Construction of public trails on levees and accessible ramps • Construction of viewpoints 	n/a	<ul style="list-style-type: none"> • Removal of the Interim Levee and excavation of a tidal channel from the Central LCWA/Central Bryant site to the Long Beach City Property site
Long Beach City Property Site	<ul style="list-style-type: none"> • Construction of an aboveground pipeline system and underground utility corridor along 2nd Street from Studebaker Road down to and along Shopkeeper Road • Removal of tank farm and 95% of pipelines 	n/a	<ul style="list-style-type: none"> • Removal of oil operations and remediation of soils to allow for restoration • Grading of site to support habitat restoration • Construction of earthen levee to protect 2nd Street and Shopkeeper Road (Perimeter Levee) • Excavation of a tidal channel from the Central LCWA/Central Bryant site to the Long Beach City Property site • Construction of public trails on levees, accessible ramps, and stairs • Construction of viewpoints
Pumpkin Patch Site	n/a	n/a	<ul style="list-style-type: none"> • Removal of oil operations, including 95% of pipelines and remediation of soils to allow for restoration of the site • Construction of earthen levee to protect the western portion of the Pumpkin Patch site (Perimeter Levee)

Grey text represents project features that interact with this program, but that are evaluated as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR



SOURCE: ESA, 2019

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-22
Artistic Rendering Levees

**TABLE 2-10
POST-RESTORATION HABITATS AND ACREAGES IN CENTRAL AREA**

Habitat Type	Existing Conditions	Near Term	Long Term
		Proposed Restoration	Proposed Restoration
Wetlands^a	68.6	63.7	64.2
Transitional zone	0.0	0.7	1.1
Salt flat	3.9	1.0	0.0
Tidal salt marsh	0.0	20.2	42.6
Non-tidal salt marsh	42.1	19.3	0.0
Brackish wetlands	3.7	3.7	2.1
Intermittently flooded brackish pond	0.4	0.4	0.0
Non-Native wetlands	1.4	0.6	0.0
Subtidal	17.2	17.8	18.5
Uplands	7.4	3.2	0.0
Native shrubland	0.2	0.1	0.0
Non-native upland	7.2	3.1	0.0
Managed Habitats	0.0	14.2	23.8
Bioswale	0.0	1.2	3.5
Vegetated levees/berms	0.0	12.9	20.4
Non-Natural	31.9	26.6	20.4
Disturbed habitat	0.1	0.0	0.0
Developed (e.g., impervious surfaces)	31.8	26.6	20.4
Total	108	108	108

^a These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

Hydrology and Grading

Further project design and analysis is needed to determine the exact method for providing tidal connection from the San Gabriel River to the Central LCWA site and the flood management features that would be needed to maintain or reduce the current level of flood risk. To address this uncertainty, this PEIR analyzes the possible range of tidal connections and flood management features in order to provide flexibility for the future design. See Chapter 5, *Alternatives*, for alternatives considered and further evaluated, which includes alternatives with a culvert connection between the Central Area and the San Gabriel River levee instead of a full connection to the river. A culvert connection would limit storm flows and decrease storm water levels, which would result in lower levee heights and result in a smaller overall footprint.

Marshplain Grading

Existing dirt road severely fragment the site ecologically and hydrologically, with elevations ranging from 6 to 10 feet MLLW on the Central LCWA and Central Bryant sites. Grading would be done in the near term to eliminate this fragmentation and establish a broad, natural marshplain, with elevations ranging between 4 to 7 feet MLLW. The excavated material would be used to

construct the new Perimeter Levee, but additional material would be needed, which could come from restoration of the South Area (Section 2.7.2, *South Area*).

Depending on the rate of sea-level rise when the long-term restoration is implemented, some areas on the Long Beach City Property site may need to be filled to raise elevations to create sustainable habitat over time with sea-level rise. Existing elevations range from 2 to 8 feet MLLW, which, depending on the amount of sea-level rise that has occurred when the restoration is implemented, would correspond to subtidal, mudflat, and low salt marsh. Grading or filling could be done to raise elevations to mid or high salt marsh with some areas of low marsh and mudflat along the tidal channels.

Tidal Channels

In the near term, new tidal channels would be excavated between the San Gabriel River and the Interim Levee to create a sinuous and branching network of tidal channels through the wetlands. The largest channels (widest and deepest) would connect up to the breach and be subtidal in elevation. The smaller channels throughout the rest of the salt marsh would be intertidal and would drain at low tide.

Perimeter Levee

The upland perimeter around the restored wetlands would be raised to function as a flood risk management levee. The levee would be constructed with a top width of 12 feet and would be approximately 4,800 feet long, running from the San Gabriel River Levee adjacent to the 2nd Street bridge, west on 2nd Street, and south on Shopkeeper Road to tie into the existing levee. The Perimeter Levee would have a slope of approximately 3:1 horizontal: vertical (H:V) down to restored salt marsh at roughly 6 feet MLLW and the same slope down to the road on the back, which would give it a footprint of 120 feet in width. The levee would be offset from the property boundaries by 30 feet to allow for road drainage to the area between the road and the levee and to limit settlement impacts (e.g., the weight of the levee impacting the surrounding area) to existing utilities along 2nd Street and Shopkeeper Road, which would remain in place. The offset would also provide space for the pipeline and utility corridor proposed as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The levee crest elevation is expected to be approximately 24 feet MLLW, or roughly 6 feet (in the east) to 11 feet (in the west) above 2nd Street (since the road slopes down from the river) and roughly 11 feet above Shopkeeper Road, as described in greater detail below in Section 2.7.4.3, *Flood Risk and Stormwater Management*. The levee would include a 12-foot-wide road on the top that would serve the dual purpose of providing access for maintenance of the levee and a public access trail (Figure 2-22).

The first part of the levee along the eastern portion of 2nd Street from the bridge to the intersection with Studebaker Road (roughly 1,500 feet) would be constructed in the near term and would tie into the Interim Levee. Approximately 65,000–72,000 cubic yards of fill would be placed in the near term to construct this portion of the Perimeter Levee. The remaining Perimeter Levee (roughly 3,400 feet) would be constructed in the long term, when the Long Beach City Property site is available for restoration. Approximately 158,000–180,000 cubic yards of fill would be placed in the long term for the construction of the Perimeter Levee along 2nd Street

from the intersection of Studebaker Road to Shopkeeper Road and down along Shopkeeper Road, south to the Pumpkin Patch site.

Interim Levee

During the near-term ecosystem restoration, an Interim Levee would be constructed along the eastern Long Beach City Property boundary on the Central LCWA site. The levee crest elevation is expected to be approximately 21 feet MLLW, or 15 feet above marshplain elevation, as described in greater detail below in Section 2.7.4.3, *Flood Risk and Stormwater Management*.

The Interim Levee would have 3:1 H:V side slopes on both sides. The levee would be constructed with a top width of 12 feet and would include a 12-foot-wide maintenance access road and a public access trail on top. Approximately 62,000–68,000 cubic yards of fill would be placed in the near term to construct the approximately 1,600-foot-long Interim Levee.

In the long term, the northern portion of the Interim Levee (the area north of the existing wells) would be removed to allow tidal connection between the Central LCWA site and the Long Beach City Property site. The material removed from the Interim Levee (17,000–19,000 cubic yards) would be used to construct the Perimeter Levee.

Well Access and Flood Control

The proposed program would grade well pads and access roads up to 19 feet MLLW (13 feet above marshplain elevation) (see below in Section 2.7.4.3, *Flood Risk and Stormwater Management*) with slopes of 3:1 H:V down to the surrounding marshplain. The access roads could be consolidated to reduce the extent in the salt marsh.

2.7.4.3 Flood Risk and Stormwater Management

The restoration and grading descriptions above describe how levee grading would support restoration functions. The sections below detail the flood risk and stormwater management functions of levees and drainage features of the proposed program.

Levees

In the Central Area, the proposed program includes a new levee along 2nd Street and Shopkeeper Road to function as a flood risk management levee, a modified Los Angeles County Drainage Area project feature. This levee would replace the existing west San Gabriel River Levee and maintain or improve the existing level of flood risk protection for 2nd Street and Shopkeeper Road from San Gabriel River flooding. The new levee would tie into the existing San Gabriel River Levee upstream and downstream of the restoration. The levee would be set at approximately 24 feet NAVD (18 feet above marshplain elevation) which includes 5 feet of sea-level rise above the existing level of flood protection (19 feet NAVD). The Interim Levee would include protection for 2 feet of sea-level rise (21 feet NAVD crest elevation), assuming it would only be required until the long-term restoration is implemented.

The Central Area is expected to primarily be a backwater area during flood events, and erosion potential is expected to be limited along most of the levee reach. The new levees may incorporate buried soil cement or rock protection of the levee core with vegetation on the slopes.

Oil Operation Flood Risk Management

Well pads and access roads in the Central LCWA and Central Bryant sites would be graded to 19 feet NAVD (13 feet above marshplain elevation) to match the existing level of flood risk protection provided by the San Gabriel River Levees. The access roads would tie the high-elevation well pads to the existing and Interim Levees.

Water-Control Structures

The existing culvert on the Long Beach City Property site connecting the site to the San Gabriel River during high tides would be left in place. The culvert would continue to allow some minor flow into the site at high tides and would provide some drainage to the site.

Stormwater Management

With the construction of the proposed levees, storage volume for the excess overflow drainage from the roads would be eliminated. Replacement stormwater storage volume would be provided by creating low areas (e.g., basins or swales) between the roads and the proposed levee. These storage basins or bioswales would be sized to accommodate the local area drainage. These basins would also function as water quality treatment measures for a portion of the runoff from the existing paved areas.

2.7.4.4 Public Access and Visitor Facilities

The proposed program would develop and improve public access, recreation, and interpretative opportunities within the Central Area in the near term, as shown in **Figure 2-23, *Proposed Central Area Near-Term Public Access***, and in the long term, as shown in **Figure 2-24, *Proposed Central Area Long-Term Public Access***.

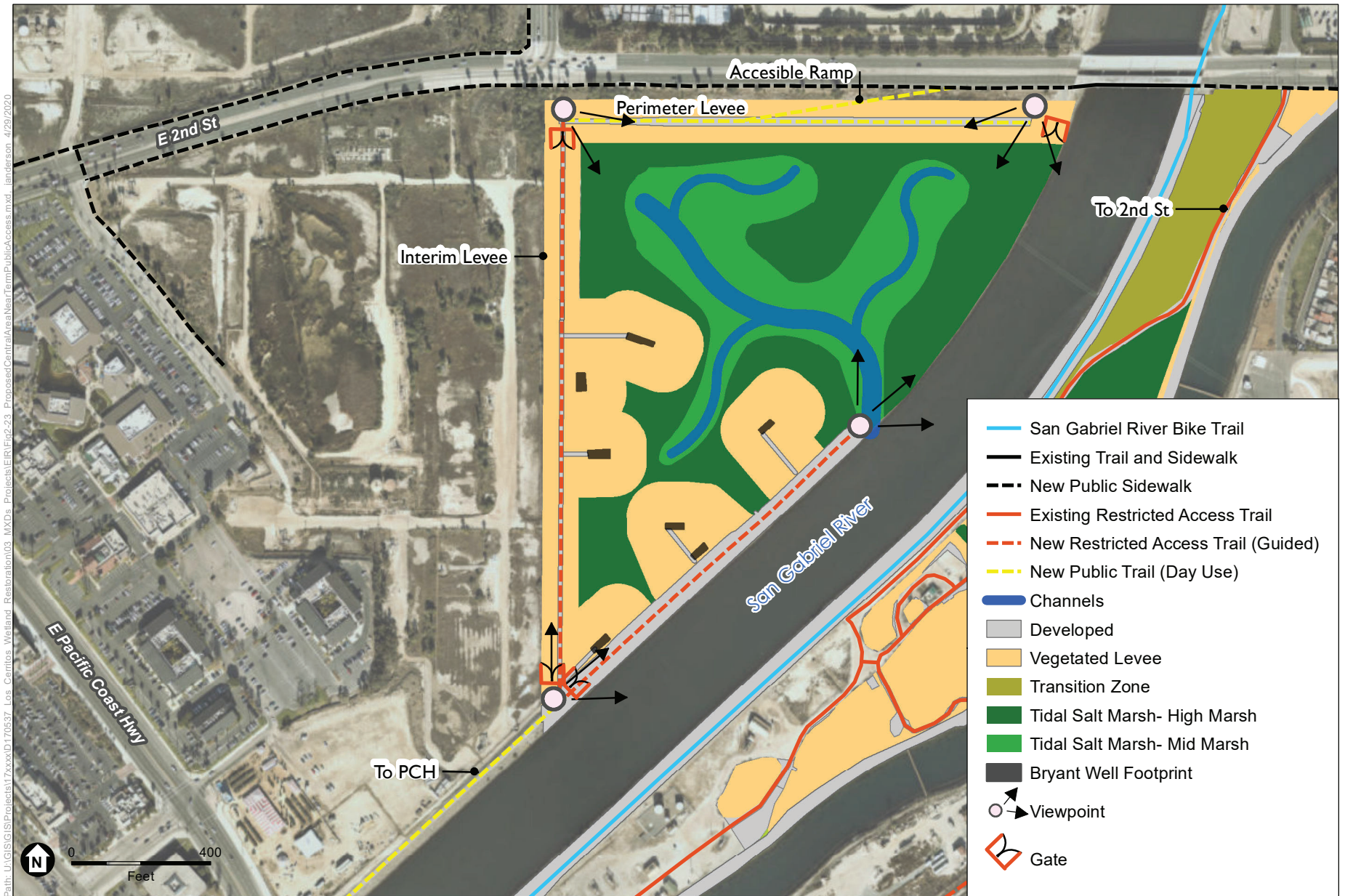
Parking

The main parking for the Central Area would be existing on-street parking along Shopkeeper Road.

Trails and Overlooks

A 12-foot-wide road would be constructed along the top of the near-term Perimeter and Interim Levees. The road on the near-term Perimeter Levee (parallel to 2nd Street) would serve multiple purposes as a maintenance access road and a public trail. It would be open to the public from dawn to dusk and would have an accessible ramp sloping up from the sidewalk along 2nd Street to the top of the levee. There would be two overlooks constructed at either end of the near-term Perimeter Levee (Figure 2-24).

The road on top of the Interim Levee (north-south between 2nd Street and the San Gabriel River Levee) would not be open to the public due to the oil operations but could be restricted to docent-led use only with gates on either end. An additional overlook would be constructed where the Interim Levee ties into the existing San Gabriel River Levee and could be accessed by the public along the existing levee from the PCH. Access would be restricted on the existing levee from the Interim Levee to the breach due to oil operations.



SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-23
Proposed Central Area Near-Term Public Access



SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-24
Proposed Central Area Long-Term Public Access

In the long term, the Central Area restoration would expand to the west, which would change and expand the public access opportunities. The maintenance road and public trail on the eastern portion of the Perimeter Levee along 2nd Street would be extended west after the rest of the Perimeter Levee is constructed (see Section 2.7.4.3, *Flood Risk and Stormwater Management*, under *Levees*). The new trail segment would have an accessible ramp and stairs up from the parking along Shopkeeper Road (Figure 2-24). A set of stairs would also be added at the northwest corner of the Perimeter Levee, near the crosswalk, to facilitate direct access from the North Area and Long Beach Visitor Center (see Section 2.7.5, *North Area*).

Sidewalk Improvements

Sidewalk improvements could be implemented in accordance with the City of Long Beach standards along the south side of 2nd Street, improving public access around the perimeter below the levee. All construction for these improvements could occur within the existing right-of-way. A crosswalk would be added at the intersection of Shopkeeper Road and 2nd Street to improve public access between the North Area, Long Beach Visitor Center, and Central Area.

2.7.4.5 Infrastructure and Utility Modification

As proposed in the Termination of Oil and Gas Lease and Grant of Easement agreement between Signal Hill Petroleum, Inc., and the LCWA, Signal Hill Petroleum, Inc. would relocate or modify aboveground pipelines and utilities on the Central LCWA site and remediate soils that have been impacted by oil operations to accommodate the restoration. Thus, restoration in the near term would include pipeline relocation, but not well relocation. Additionally, outside of this agreement, existing Signal Hill Petroleum, Inc. wells would be protected in place by proposing to raise the wells out of the floodplain to 19 feet NAVD, 13 feet above marshplain elevation. When Signal Hill Petroleum, Inc. elect to modify their oil operations, the changes would be analyzed under a separate CEQA document.

The decommissioning of oil wells and associated oil production infrastructure on the Long Beach City Property site and the Pumpkin Patch site is discussed in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse No. 2016041083).

Pipeline Removal

Pipelines to be demolished on the Central LCWA site would be identified and marked in the field and permanently isolated from sections of the system that would continue operating. Many of these pipelines occur in wetland areas. The pipelines would be removed in compliance with applicable standards required by CalGEM and Department of Toxic Substances Control (DTSC). Removal of pipelines could involve excavation of contaminated soil. If contaminated soil is encountered, the material would be tested and assessed to determine remediation options in compliance with applicable regulatory standards.

Raising Wells

To raise the oil well pads, the wells would be temporarily taken off production and all equipment would be removed from each well (pumping units, concrete pads, electrical equipment, etc.). A temporary retrievable plug would be placed in each well and a casing riser would be installed. Once the well pad grading and construction are complete, the wells would go back into production.

Well Abandonment

In the long term, the oil wells and associated oil production infrastructure on the Central LCWA site may be decommissioned and removed as part of restoration activities. Because there are no agreements in place between the oil operators and LCWA on the Central LCWA site for oil well abandonment, it is expected that overall levels of oil and natural gas production would continue until production decreases to below economically viable levels, after which oil production would stop. When the owner/operators of those oil operations elect to change or close those operations, the changes would be analyzed under separate CEQA documents. The work involved in abandoning oil wells is discussed under the heading Oil Well Abandonment in Section 2.7.6.4, *Implementation Methods*.

2.7.5 North Area

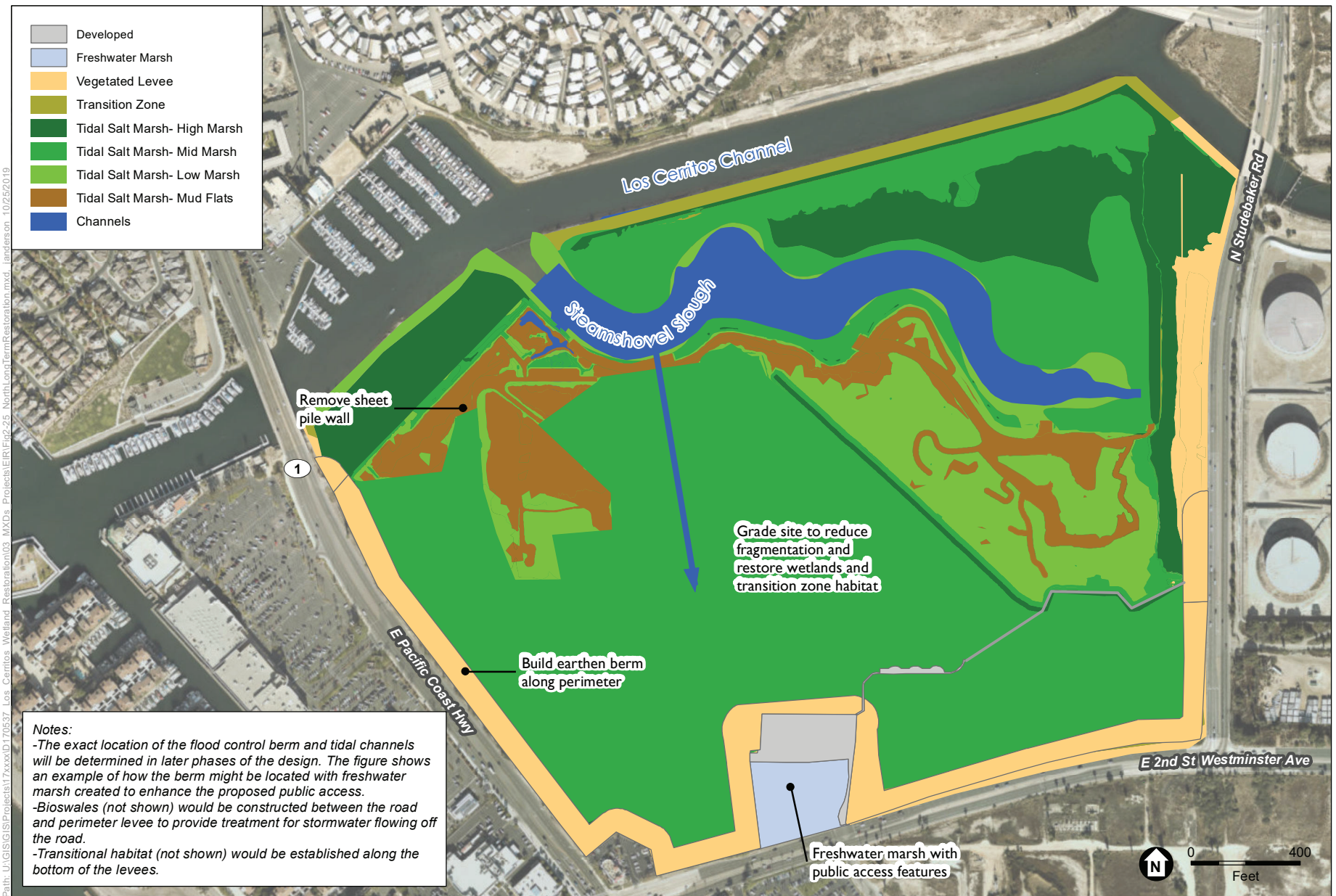
2.7.5.1 Phasing

Ecosystem restoration on the Alamitos Bay Partners site and Southern Synergy Oil Field site would occur in the long-term phase based on land and oil lease ownership (see the description of near-term phase activities in Section 2.4.4, *Los Cerritos Wetlands Oil Consolidation and Restoration Project*). The Northern Synergy Oil Field site is part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project and would be restored in the near-term phase.

Long-term activities would include (**Figure 2-25, Proposed North Area Long-Term Restoration**):

- Remediating soils (e.g., on-site treatment, excavation and removal, or cap in place) that have been impacted by oil operations on the Alamitos Bay Partners site;
- Grading the Alamitos Bay Partners site and the Southern Synergy Oil Field site, including excavation to create channels, and revegetation to support a diversity of marsh, transitional, and upland habitats;
- Constructing a new earthen levee or flood wall along the Southern Synergy Oil Field and Alamitos Bay Partners sites to protect 2nd Street and Pacific Coast Highway from flooding;
- Excavating a tidal channel from the Northern Synergy Oil Field site to the Southern Synergy Oil Field site to increase tidal connection in the Southern Synergy Oil Field site; and
- Removing the sheet pile wall along the Alamitos Bay Partners site.

Table 2-11, North Area Phasing, summarizes the activities associated with each phase.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Draft Program EIR
Figure 2-25
 Proposed North Area Long-Term Restoration

**TABLE 2-11
NORTH AREA PHASING**

	Near Term (0–10 years)	Mid Term (10–20 years)	Long Term (20+ years)
Northern Synergy Oil Field Site	<ul style="list-style-type: none"> • Remediation of soils and relocation of oil infrastructure • Construction of a new berm and sheet pile wall barrier along the southern limits of the site • Grading tidal channels to support habitat restoration • Removal of segments of the existing berm separating Steamshovel Slough from the site 	n/a	n/a
Southern Synergy Oil Field Site	<ul style="list-style-type: none"> • Development of the Long Beach Visitor Center and parking lot from existing office building • Construction of trail, sidewalk enhancements, and bikeway improvements 	n/a	<ul style="list-style-type: none"> • Remediation of soils and relocation oil infrastructure • Removal of the sheet pile wall barrier constructed in the near term • Grading of site to support habitat restoration • Construction of earthen levee or flood wall to protect 2nd Street and Pacific Coast Highway • Excavation of a tidal channel from the Northern Synergy Oil Field site to the Southern Synergy Oil Field site
Alamitos Bay Partners Site	n/a	n/a	<ul style="list-style-type: none"> • Remediation of soils and relocation oil infrastructure • Grading of site to support habitat restoration

Grey text represents project features that interact with this project, but that were evaluated as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR

2.7.5.2 Ecosystem Restoration

Restored Habitats

Salt marsh and transitional wetland grading would occur across the southern portion of the Southern Synergy Oil Field site and the Alamitos Bay Partners site to lower the elevation of on-site roads and abandoned oil well pads to wetland elevations, where needed. Elevations would be graded to create a mix of habitats, including subtidal, intertidal salt marsh, transitional zones, and upland. Tidal channels would be excavated to connect to the northern portion of the site and bring tidal flows south. The proposed sheetpiling between the northern and southern portions of the site would be removed in the long term.

Restoration habitat targets and acreages are presented in **Table 2-12, *Post-Restoration Habitats and Acreages in North Area***.

TABLE 2-12
POST-RESTORATION HABITATS AND ACREAGES IN NORTH AREA

Habitat Type	Existing Conditions	Long Term
		Proposed Restoration
Wetlands^a	40.2	67.1
Salt flat	9.8	0.0
Tidal salt marsh	0.0	63.1
Non-tidal salt marsh	30.4	0.0
Freshwater wetland	0.0	2.1
Subtidal	0.0	2.0
Uplands	10.2	0.0
Native shrubland	1.2	0.0
Non-native upland	9.0	0.0
Managed Habitats	0.0	11.1
Vegetated berms	0.0	11.1
Non-Natural	22.8	1.7
Disturbed habitat	1.4	0.0
Developed (e.g., impervious surfaces)	21.4	1.7
Total^b	73	80

^a These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

^b Acreages do not include the Northern Synergy Oil Field site.

Hydrology and Grading

Marshplain Grading

Existing on-site road and oil well pad elevations range from 6 to 8 feet MLLW and severely fragment the site ecologically and hydrologically. Grading would be done to eliminate this fragmentation and establish a broad, natural marshplain. At current sea level, the elevations of the rest of the site (3 to 6 feet MLLW) would generally support mudflat, low marsh, and mid marsh habitats. Depending on the amount of sea-level rise that has occurred when the restoration is implemented, these lower areas of the site may support different habitats (e.g., mudflat or subtidal). The soil generated by removing roads, pads, and berms and excavating new tidal channels could be used beneficially on site to create more mid and high marsh and/or gently sloping transition and upland habitats. Conversely, additional material could be brought in from off site to raise elevations.

Establish Tidal Channels

Tidal channels would be excavated between the northern and southern area in order to increase tidal exchange in the latter. The tidal channels would expand tidal influence and convert areas from non-tidal to tidal wetlands.

Construction of a Flood Control Berm

A new earthen berm or flood wall would be constructed in the long term along the perimeter of the southern edge of the Southern Synergy Oil Field Site and Alamitos Bay Partners site. An example berm location is depicted in Figure 2-25, but would be refined as part of the design process. A berm would support some upland habitat while a flood wall would allow for more wetland area.

2.7.5.3 Flood Risk and Stormwater Management

The restoration and grading descriptions above describe how grading would support restoration functions. The sections below detail the flood risk and stormwater management functions of berms and drainage features of the proposed program for the North Area.

Berms/Flood Walls

In the long term, the proposed program would require a berm or flood wall to protect roadways and adjacent infrastructure from flooding. The new berm or flood wall would tie into high ground along Studebaker Road in the east, and the PCH bridge in the west. The exact location of this program component will be determined in later phases of the design, subsequent to the preparation of this PEIR, but an example berm location is depicted in Figure 2-25. The elevation of the berm crest or flood wall would be set based on the existing level of flood protection plus an allowance for sea-level rise, as is appropriate at the time of implementation.

Stormwater Management

With the construction of the proposed berm or flood wall, storage for the overflow of stormwater draining from the roads would be reduced. Room for stormwater storage between the road and berm or flood wall would be provided by creating low areas (basins or swales) between the roads and the proposed levee. These storage basins or bioswales would be sized to accommodate the local area drainage. These basins would also function as water quality treatment measures for a portion of the runoff from the existing paved areas.

2.7.5.4 Public Access and Visitor Facilities

No public access improvements would be constructed within the North Area as part of this program. The Los Cerritos Wetlands Oil Consolidation and Restoration project would include new public access opportunities (see Section 2.4.4, *Los Cerritos Wetlands Oil Consolidation and Restoration Project*, for further information). The Los Cerritos Wetlands Oil Consolidation and Restoration Project (State Clearinghouse No. 2016041083) includes the development of a parking lot at the Long Beach Visitor Center.

2.7.5.5 Infrastructure and Utility Modification

In the long term, the oil wells and associated oil production infrastructure on the Alamitos Bay Partners site would need to be decommissioned and removed before restoration can occur. Because there are no agreements in place between the oil operators and LCWA on the Alamitos Bay Partners site, it is expected that overall levels of oil and natural gas production would continue until production decreases to below economically viable levels, after which oil

production would stop. When the owner/operators of those oil operations elect to change or close those operations, the changes would be analyzed under separate CEQA documents. The work would involve plugging and abandoning oil wells, and is discussed under the heading Oil Well Abandonment in Section 2.7.6.4, *Implementation Methods*. Infrastructure on the Southern Synergy Oil Field Site would be removed as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project (State Clearinghouse No. 2016041083).










2.7.6 Implementation and Restoration Process

Implementation would include: clearing and grubbing, grading and soil transport across and off-site, soil remediation, levee lowering and breaching, revegetation, construction of flood risk and stormwater management facilities, access roads/trails, the visitor center and utility modifications.

2.7.6.1 Schedule

Table 2-13, *Restoration Schedule*, shows the proposed construction schedule for the program. Each phase of the proposed program will take multiple years to complete construction activities and with multiple years anticipated between each phase.

**TABLE 2-13
RESTORATION SCHEDULE**

	Near Term (0–10 years)	Mid Term (10–20 years)	Long Term (20+ years)
South Area			
Isthmus Area			
Central Area			
North Area			

2.7.6.2 Earthwork Quantity Estimates

Table 2-14, *Approximate Earthwork Soil Volume for Near Term*, summarizes the earthwork quantity estimates for the program in the near term. **Table 2-15**, *Approximate Earthwork Soil Volume for Long Term*, summarizes the earthwork quantity estimates for the program in the long term, by area. Levee dimensions would be refined during final design as needed to meet Corps requirements, including Section 14 of the Rivers and Harbors Act and Section 408 requirements for modifications to Corps-approved flood risk management systems. The final volume of fill placement for levee construction would depend on the final design and the actual conditions during restoration (e.g., the compatibility of excavated soils). High estimates of potential fill volumes are analyzed in this document; actual fill volumes may be less.

**TABLE 2-14
APPROXIMATE EARTHWORK SOIL VOLUME FOR NEAR TERM**

Feature/Action	Cut Quantity (cy)	Fill Quantity (cy)
Central Area		
Central Area Perimeter Levee, near term	0	78,000–86,000
Interim Levee	0	74,000–82,000
Raising Wells and Access Roads	0	108,000
Central LCWA and Central Bryant Marsh Grading	44,000–82,000	0
Total	44,000–82,000	260,000–276,000
South LCWA Perimeter Berm	0	18,000
South LCWA Marsh Grading (avoiding high-functioning marsh habitat)	315,000–412,000	assume no fill needed
Total	358,000–494,000	278,000–294,000
Total cut/fill balance	64,000–216,000 cy excess material	

**TABLE 2-15
APPROXIMATE EARTHWORK SOIL VOLUME FOR LONG TERM**

Feature/Action	Cut Quantity (cy)	Fill Quantity (cy)
North Area		
North Area Berm	0	155,000
Southern Synergy Oil Field and Alamos Bay Partners Sites Marsh Grading		100–135,000
Total	0	155,000–290,000
Total cut/fill balance	155,000–290,000 cy material needed	
Central Area		
Central Area Perimeter Levee, long term		190,000–216,000
Interim Levee Removal (northern portion)	17,000–19,000	
Long Beach City Property Site Marsh Grading		1,000–47,000
Total	17,000–19,000	191,000–263,000
Total cut/fill balance	172,000–246,000 cy material needed	
South Area		
Hellman Retained Site Marsh Grading	0–88,000	0–2,000
Total cut/fill balance	2,000 cy material needed–88,000 cy material cut	

This table does not include the excess fill from Table 2-14, which could be used to offset the needed material in the long term.

Excavation in the South LCWA site to lower the area to marshplain is expected to generate between 315,000 and 412,000 cubic yards of soil, depending on final marshplain grading. In the near term, approximately 178,000 to 232,000 cubic yards of soil would be needed in the Central LCWA site, depending on final levee design, levee compaction, and final marshplain grading. The extra material generated from the South LCWA site could be stockpiled for the long term, when the Central Area would need 172,000 to 246,000 cubic yards of material. Based on these estimate ranges, there could be 62,000 cubic yards of excess material to export or a need to import 163,000 cubic yards of material. The future design should seek to balance cut and fill as much as possible on site.

In the long term, approximately 155,000 to 290,000 cubic yards of material would be needed to raise the Southern Synergy Oil Field and Alamitos Bay Partners sites and to construct the North Area berm. Based on the final marshplain grading design, the Hellman Retained site could generate 88,000 cubic yards of material or require 2,000 cubic yards of fill. The future designs of these sites should seek to balance cut and fill as much as possible on site.

Although quantities for cut and fill have been estimated for the conceptual design, exact calculations of how much excess fill would be generated by the excavation of wetlands areas will be determined in the final levee design process in cooperation with LACFCD and the Corps.

2.7.6.3 Stockpiling and Excess Fill Placement

In the near term, soil excavated from the South LCWA site could be stockpiled on the Long Beach City Property site, in order to stockpile the soils for long-term construction of the perimeter levee as discussed in Section 2.7.4, *Central Area*. In the near term, soil not needed for levee construction would be placed in upland areas or exported (see *Off-Site Soil Export* under Section 2.7.6.4, *Implementation Methods*, on the following pages).

2.7.6.4 Implementation Methods

Earthwork and Soil Transport

Much of the proposed program's earthwork would be accomplished by traditional land-based equipment (e.g., scrapers and excavators); however, marine construction equipment may also be used. Wetland restoration earthwork also would require some special equipment and implementation methods, as high groundwater and weak soils can preclude use of traditional land equipment. Specialized equipment and construction methods that may be needed, along with more typical techniques, are described in **Table 2-16, *Equipment and Earthwork Methods for Wetland Restoration***.

Soil transport would be accomplished using scrapers and loaders, haul and dump trucks, track excavators and dozers, trucks or other low ground pressure equipment, or by hydraulic dredge. **Table 2-17, *Soil Transport Methods between Sites***, summarizes possible methods for transporting soil between the South, Isthmus, Central and North Areas that the restoration contractor could use to cross the San Gabriel River, including a temporary floating crossing or using existing roadways.

Levee and Berm Lowering and Breaching

Levee and berm lowering would involve a phased removal of earth to maximize the quantity that is moved prior to breaching and to limit the risk of uncontrolled breaching. The restoration contractor would be required to sequence work to prevent site inundation, and typically would do this by leaving a small raised area (e.g., a "check berm") until final earthwork. Final earthwork often consists of dozer operation to quickly remove the check berm and side cast earth into the site. This last work may be timed for a neap tide (i.e., least difference between low and high tides) and staged to maintain access and egress along portions of the berm. Alternatively, the contractor could use steel sheet pile coffer dams along the levee to allow for levee lowering during all tide levels.

TABLE 2-16
EQUIPMENT AND EARTHWORK METHODS FOR WETLAND RESTORATION

Equipment	Earthwork Methods
Special Equipment and Methods for Wetland Restoration	
Low ground pressure equipment	Smaller, lighter equipment with large surface area tires or treads that reduces bearing pressure.
Mats	Timber planks (thick) lashed together and moved by bucket-type equipment.
Long-reach excavator	Track or wheel mounted excavator with a long arm and small bucket to allow extended reach to over 40 feet.
Clamshell and dragline crane	Usually track mounted, can reach 60 feet or more.
Amphibious excavator	Can float and can excavate in shallow standing water.
Rotary ditcher	Excavates with rotating wheels that spray sediment across adjacent areas, resulting in a narrow ditch. Typically pulled behind other equipment but can be self-propelled.
Floating equipment	Cranes and excavators can be floated on barges for both transport and operation. Equipment can be trucked in and assembled to work in land-locked water bodies.
Hydraulic dredge	A water and sediment mixture can be excavated and pumped.
More Common Construction Equipment	
Grader	
Truck	
Loader	
Backhoe	
Generator Set	
Drill Rig	
Forklift	

TABLE 2-17
SOIL TRANSPORT METHODS BETWEEN SITES

Method	Application
Barge/floating crossing	Straight between the South Area and the Isthmus Area (across the Haynes Cooling Channel) or between the Isthmus Area and the Central Area (across the San Gabriel River)
Existing roadways	From the South Area along the PCH to 2nd Street to reach either the Southern Synergy Oil Field site or the Long Beach City Property site; through the Long Beach City Property site to reach the Central LCWA and Central Bryant sites.
Temporary bridge	Between the Isthmus Area and the Central Area (across the San Gabriel River)

Breaching would also be phased, similar to levee and berm lowering. Breaching usually is accomplished by two long-reach excavators working on the lowered berm on either side of the breach to be excavated. At first, earth would be loaded onto trucks and taken elsewhere. Once the berm section is reduced to the point of incipient breaching at the next high tide, the operation usually shifts into a high production rate mode with excavated material sidecast. Often, other excavators and low-ground pressure dozers rehandle the sidecast earth and displace it farther away from the breach, thereby limiting the height of the side cast and maximizing the excavation rate. The work continues until the breach is excavated or the tides approach the levee surface.

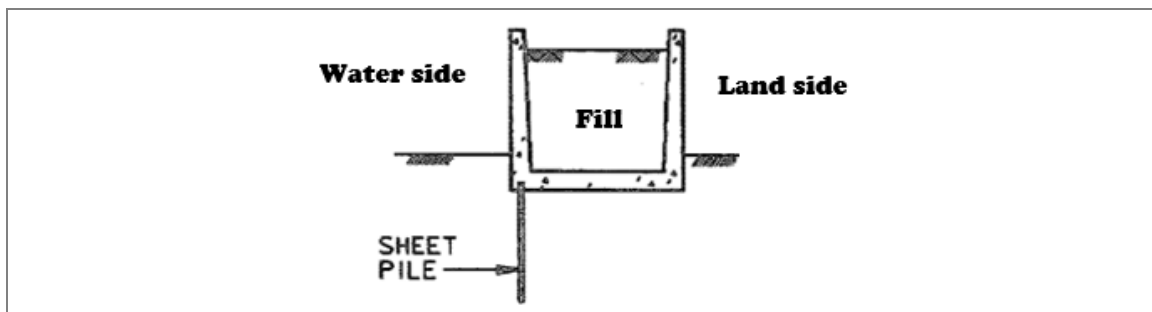
Construction Period Levee Stability

Levee stability would be addressed by staged construction with geotechnical recommendations. Levee construction often requires a phased construction to compensate for settlement and to avoid overloading the subgrade and causing shear failure (e.g., sliding failure) and mass movements. The increased weight of an earth levee typically would result in consolidation of underlying soils and settlement. The increased weight also would increase the shear stresses in the foundation soils, and can cause shear failure and deformation, and compromise the levee construction. Consequently, levee construction often requires a second construction phase one or more years later to compensate for settlement.

Flood Wall Construction

To construct a flood wall, existing soil would be excavated and backfilled with selected native or imported earth. The backfill would be placed in thin, uniform lifts (e.g., 6-inch vertical thickness) and compacted under controlled moisture conditions to achieve a dense mat with adequate strength and limited permeability to groundwater flow. This construction would require temporary construction shoring and dewatering. Alternatively, or in addition to over-excavation and engineered backfill, in-situ earth densification techniques could be employed, such as deep-soil-mixing, where grout is injected and mixed with the soil.

Next, the gravity structure foundation would be constructed. The foundation would include a cut-off wall to control seepage. This could be a steel-sheet pile wall driven into the ground a distance approximately equal to the height of the wall (**Figure 2-26, Example of Sheet Pile Cut-off Wall**), although deeper embedment may be needed, depending on the engineering properties of the soils and the structural scheme. The cut-off wall would need to connect to the flood wall and, hence, would be part of the wall or embedded into cast-in-place concrete wall. A deep-pile foundation might be selected due to weak soils and seismic design criteria (earthquake loads). The precast piles would be driven into the ground by impact or vibratory hammer and crane, or cast-in-drilled-hole (CIDH) piles would be employed. The CIDH piles avoid impact driving, but drilling mud and water control would be required. The required pile length would be determined through further analysis, but lengths of at least 40 feet are assumed. The number of piles would be related to the mass and geometry of the structure and therefore, the height of the wall, engineering properties of the soils, and the seismic design criteria, which would be determined during design.

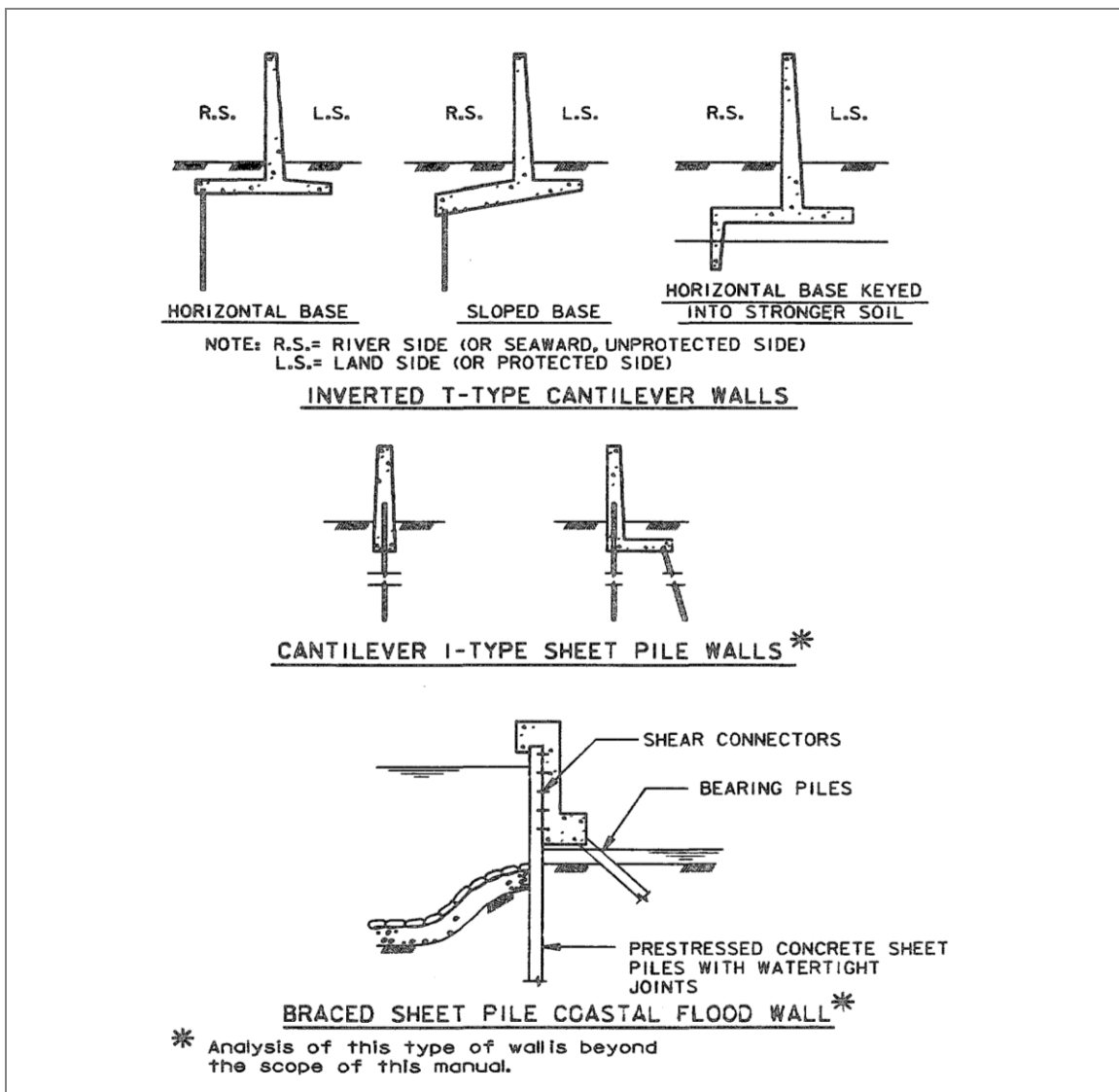


SOURCE: USACE, 1989

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-26
Example of Sheet Pile Cut-Off Wall

Finally, the wall structure itself would be constructed. For short wall heights (e.g., 5 feet tall), the wall configuration would consist primarily of a single vertical element, connected to the below-grade cutoff wall via a cantilever (single vertical member), or an “I-wall” or “T-wall” geometry (**Figure 2-27, Example of “I” and “T” Type Flood Walls**). As shown in **Figure 2-28, Example of “I” and “T” Type Flood Walls on Earth Levees**, these “short” flood walls are also used in concert with earthen levees (USACE, 2000). A cellular or other more massive structure would be used for taller wall heights. If a cellular sheet pile structure is employed (**Figure 2-29, Example of Cellular Sheet Pile Flood Wall**), steel sheets would be used and horizontal steel beams (typically called “wales”) and or caps (typically cast-in-place concrete) could be added to brace the sheet piles. King-piles of greater size and strength could be arrayed within the cell walls. Earth or other fill would be placed in the cells. Architectural treatments would be employed for aesthetics and public access.



SOURCE: USACE, 1989

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-27
Example of “I” and “T” Type Flood Walls

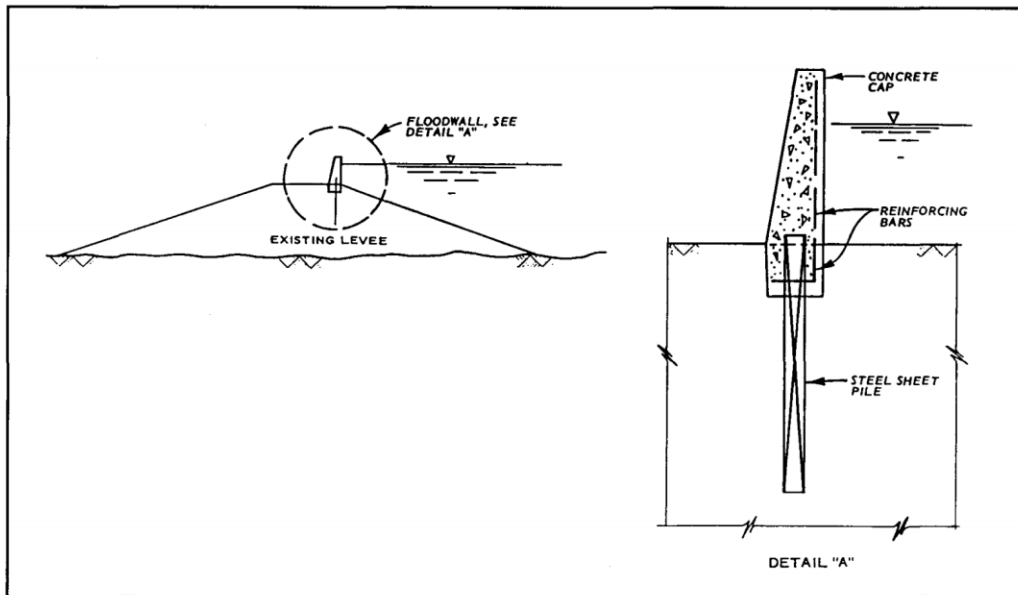


Figure 8-7. I-type floodwall-levee enlargement

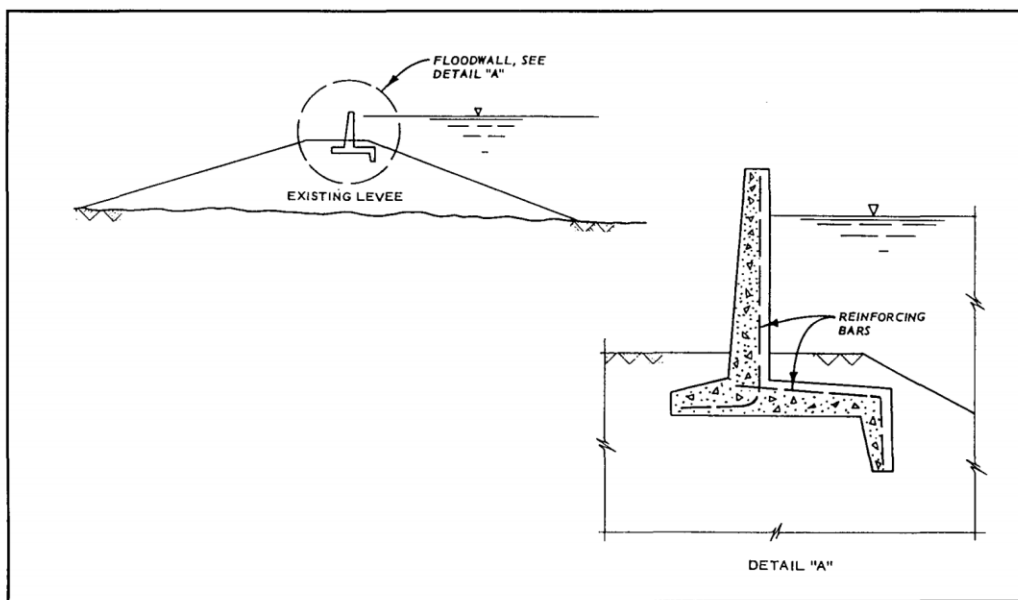


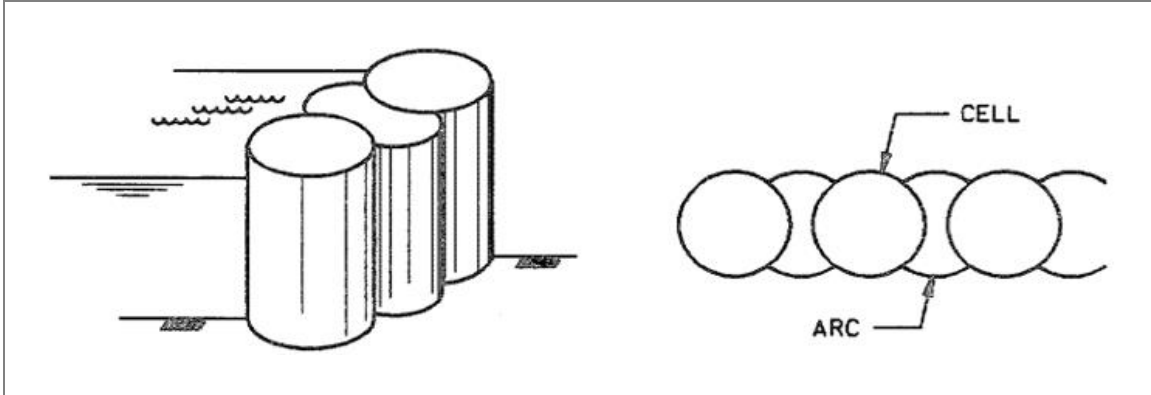
Figure 8-8. Inverted T-type floodwall-levee enlargement

8-15

SOURCE: USACE, 2000

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-28
Example of "I" and "T" Type Flood Walls on Earth Levees



SOURCE: USACE, 1989

Los Cerritos Wetlands Restoration Plan Draft Program EIR

Figure 2-29
Example of Cellular Sheet Pile Flood Wall

Off-Site Soil Export

In the proposed program, some excavated soil could be exported from the site. There are three options for off-site soil export and disposal:

1. Export via trucks with disposal at local landfills, the most likely of which could include Scholl Canyon Landfill in the City of Glendale, Frank R Bowerman Landfill in Irvine, and/or Olinda Alpha Landfill in Brea;
2. Export via barge to the Port of Long Beach or Port of Los Angeles, transfer to trucks for upland disposal at local landfills; or
3. Export via barge to an off-shore disposal location, potentially including the Los Angeles ocean disposal site off the coast from San Pedro (LA-2) or the Newport Bay ocean disposal site off the coast from Newport Beach (LA-3), each of which is managed by the United States Environmental Protection Agency (USEPA).

Clearing and Grubbing

Vegetation would be biologically monitored, cleared, and grubbed prior to grading. Native plants and seeds/cuttings may be salvaged and reused for revegetation of restored areas. Invasive-nonnative plants would be stockpiled on site and treated (e.g., composted). If possible, the preferred approach would be to bury non-native plant material in upland fill areas at a depth below which the nonnative vegetation or seedbank could reestablish. Non-native plant material may also be exported and disposed of off-site as described above (e.g., Options 1 and 2).

Non-native Plant Material Treatment

After grading, non-native plants would be removed prior to and concurrent with revegetation to ensure native habitat enhancement. Specifically, invasive non-native species populations designated as High by California Invasive Plant Council would be targeted for removal. If other invasive non-native plant species listed as having a moderate or limited impact by the California Invasive Plant Council are present, they would be removed if, based on the CDFW's review, they are negatively affecting habitat and/or restoration efforts at the site.

Recommendations contained in the California Invasive Plant Council Weed Workers Handbook and website (2014) and at the U.S. Department of Agriculture (<http://plants.usda.gov/java/noxiousDriver>) would be followed. Mechanical removal is the preferred method of removing invasive species; accordingly, invasive plant species removal would occur using mechanical methods to the maximum extent possible. This method of removal would be used in areas where the associated ground disturbance would not adversely affect sensitive wildlife species. Plant materials that are removed would be removed entirely and disposed of carefully, including stems and all root fragments, to prevent regeneration or spread. In general, removal would be performed during the late winter or early spring when soils are moist enough to remove entire plants without breaking the roots. Invasive species would be removed before the species set seed. When this is not feasible, seed heads would be removed from plants prior to removing the stems and roots. Seed heads of invasive species would be placed in plastic trash bags and removed from the site for proper disposal.

If mechanical or hand removal methods are tried and found to be ineffective after two years of repeated treatment, or the problem is too widespread for hand removal to be practical, then chemical controls would be implemented as described below. For some species, particularly woody species or large-biomass species (e.g., pampas grass), mowers, chainsaws, or other handheld equipment may be used if the eradication method would not adversely affect sensitive wildlife species.

Invasive plant materials that are removed would be disposed of carefully to prevent regeneration or spread. For plants that are not in seed, the material could be left on site to decompose. For any plants with seed, they would be removed from the site in a manner that does not disperse seed (in plastic bags for example) and disposed of at an off-site disposal area.

Herbicides would be used in accordance with manufacturers' application guidelines for specific species when manual and mechanical removal methods are not effective, and may be used in conjunction with physical removal methods for species that are known to be difficult to control. The program's restoration contractor would prepare an herbicide treatment plan for each treated invasive species, including such information as the type of herbicide to be used, application rates, and timing of treatment. Herbicides would be applied using a localized spot-treatment method and applied in a manner that would eliminate or reduce drift onto native plants. Herbicides would be applied to cut stumps for larger plants or large clumps of herbaceous non-native species that cannot effectively be removed. In all such cases, they would be used only to the extent necessary to support native plant establishment and limit adverse impacts to sensitive species and habitats. For sites within 100 feet of a wetland or stream, herbicides approved by USEPA for use near wetlands and streams, such as the glyphosate-based Rodeo® or the imazapyr-based Habitat® would be used. Herbicides would not be used when rain is predicted within 24 hours after application or if wind conditions are not appropriate for application, and herbicide application would not resume again until 72 hours after rain. Herbicide rates would vary depending on the size of the plants treated. Any use of herbicides would also be in full accordance with any applicable rules and restrictions, including any restrictions in the Local Coastal Program.

Revegetation of Graded and Disturbed Areas

Restoration of target habitats will require active revegetation, including irrigation, soil conditioning and amendments, and weed control. Topsoil management during grading will be important to monitor for the suitability of target vegetation. For instance, upland habitats (coastal sage scrub, grassland, levee plantings) will require soils with a low salt content. Soils could be amended or leached of salts through irrigation. High-clay soils that are not compacted will be used for salt marsh and other wetland habitats.

Soils would be prepared before plant establishment. Soil preparation would include proper drainage, nutrient and mycorrhizae content, and erosion control. Top soils in all areas to be planted could be tested prior to being placed to assess whether they would support the target plant community. Soils that are not appropriate for vegetation establishment could then be placed elsewhere, buried, or amended, as feasible. Typical soil amendments may include compost, mycorrhizae, and fertilizer. Excess fertilizer application can favor the establishment of generalist non-native plant species over locally adapted native plant species; however, a minimal amount of fertilizer may be necessary to establish native plants if soil quality is found to be particularly poor and low in nutrients. If found to be necessary, amendments would be tilled into the upper 8 to 12 inches of soil.

All seed and plant material will be collected from local sources, preferably from Los Cerritos Wetlands when possible. Seeds will not be collected from other restoration sites, only natural populations. Potential sites for seed collection could include, but are not limited to: El Segundo Dunes Preserve, Bolsa Chica Ecological Reserve, Upper Newport Bay Ecological Reserve, Ballona Wetlands, Mugu Lagoon, and Seal Beach National Wildlife Refuge. Seeds would be collected by hand during the appropriate season for each species and would be propagated at a local native plant nursery and/or the on-site nursery adjacent to Zedler Marsh.

A temporary drip or spray irrigation system would be installed to provide water to the plantings during the establishment period following plant or seed installation.

Wetland and Transitional Areas

The restored salt marsh would be re-vegetated through a combination of seeding and installation of nursery stock. Restoration would include soil amendments (to alter soil texture and nutrients), irrigation, and weed control, under an adaptive management approach.

Revegetation activities in non-tidal wetlands and transitional areas would include removing or controlling invasive plant species and seeding/planting native plant species. Invasive-nonnative plant species would be removed or treated according to the protocols described in Section 2.7.6.4, *Implementation Methods*, under *Nonnative Plant Material Treatment*.

In tidal wetlands, irrigation would be used to lower soil salinity and aid establishment. Regular irrigation would be required during the first spring and first summer after planting. After the plants are established, irrigation would no longer be required. Irrigation water sources are described below.

Upland Areas

Upland and transition zone plants would be irrigated in the wet season as needed to supplement natural rainfall. Irrigation in uplands should last only for the first one or two years with the precise duration, frequency, and amount of water used dependent upon annual precipitation, temperatures, and vegetation type.

Water Sources for Restoration and Irrigation

Domestic Water Meters

Water meters can be installed by the utility providers from the existing domestic water mains surrounding the program boundary. These mains are relatively large for irrigation use and available for new water meter services. Construction impacts would be limited to the one to two days required for each meter and lateral installation.

In addition to water meters installed by utility providers, existing fire hydrants can provide domestic water service to the program site. A temporary utility company provided meter would be attached onto one of the hydrant outlets for access to potable water. If the hydrants are on the side of the street opposite the program boundary, either a temporary pipeline crossing of the street or filling of water trucks at the meter and transfer by vehicle would be required.

Recycled Water Meters

A meter service connection to existing recycled water mains could be provided. The quality of the recycled water is intended for irrigation use and meets California Title 22 standards. Depending on the tolerance of the proposed plant palette for the quality of recycled water available, the water service lifespan could be continued during the plant establishment period.

Oil Well Abandonment

When the owner/operators of oil operations in the program area elect to change or close those operations, the changes would be analyzed under separate CEQA documents. The closure procedures and impacts analysis would be similar to those described and analyzed within this PEIR.

Well Abandonment

The process of abandoning a well would include bringing in a workover rig to remove downhole piping and setting cement plugs to isolate the producing zones. The wellhead would then be removed and the well casing cut and capped approximately 5 feet below grade. All concrete cellar material and piping would be removed. The well abandonment process would take between 30 and 45 workdays to complete.

Investigate and Remediate Contamination Associated with Oil Wells

During well abandonment, heavy petroleum hydrocarbons (e.g., crude oil) may be present in near-surface soil. This represents incidental contamination from normal oil field activities, such as spills of work-over fluid, small oil spills, or leaks, or from contamination left in sumps commonly placed next to oil wells to collect and circulate drilling muds. Before the wells are drilled and after well abandonment, the appropriate oil company and its consultants would investigate potential oil contamination in near-surface soils (down to 15 feet below ground surface). If significant amounts of petroleum are found, the oil company and its contractor would

remediate or remove the contamination for off-site disposal. Each investigation would take up to 2 weeks to complete; remediation work at each site may continue for up to 2 months.

Soil Remediation

Based on the Phase I⁸ findings, there is likely potential that the program sites have been impacted from past oil operations. These include the presence of petroleum hydrocarbons and bi-products in on-site soils and sediment. Impacted soils may therefore require management and potential remediation depending on constituent concentrations and regulatory action levels. The concentration and extent of impacted soils will be better defined as part of a Phase 2 investigation. Potential remediation activities may include in-situ treatment/remediation, removal and disposal at a permitted facility, and/or stabilization and containment. The remediation approaches will be developed following the investigation to further define the levels and extent of contamination that will inform the project design and remediation approach.

2.7.7 Monitoring and Adaptive Management

The complexity of a large-scale restoration, with ecological and funding objectives, constraints, and the presence of sensitive habitats and species, necessitates careful implementation of restoration within a monitoring and adaptive management program.

Adaptive management is an iterative process of decision making in the face of uncertainty, with the aim of reducing uncertainty over time through monitoring. Since ecological restoration involves many variables, especially in systems as large and complex as the Los Cerritos Wetlands, there is uncertainty in how the project would perform. Designing and implementing this project using an adaptive management approach would lead to better outcomes and help the project meet its goals.

The adaptive management approach relies on monitoring data to regularly assess progress of the site towards achieving the project goals. If the data shows the project is off-track, certain actions are taken (e.g., tweaking techniques and/or later designs) to achieve the project goals.

Small-scale experiments and pilot projects will be implemented that seek to address gaps in scientific knowledge regarding habitat, wildlife, and restoration and enhancement activities. Results of these experiments will be used to inform adaptive management for the proposed program and potentially for other restoration sites in the region and beyond.

2.7.7.1 Monitoring Program

The goal of monitoring is to inform the adaptive management process and assess progress toward meeting performance criteria. Careful restoration planning, including identification of important data gaps and collection of pre-project data, would help in setting appropriate performance criteria. Performance criteria for the project may be set in a variety of ways, but typically include input from regulatory and permitting agencies. Suitable reference sites, such as Seal Beach National Wildlife Refuge, may also be appropriate for informing performance criteria.

⁸ Environmental assessments of soils are conducted in two phases.

Restoration sites evolve and mature over timelines that are longer than typical monitoring periods. Monitoring of the site into the future would inform adaptive management, provide important data for informing future phases of restoration at the site, and contribute to a better understanding of restoration trajectories for practitioners throughout southern California. Furthermore, opportunities to partner with local universities and other research institutions will be identified to implement research activities in suitable areas of the program.

Monitoring would focus on the major biotic and abiotic factors that drive habitat development and ecosystem function—in particular, those factors that can be manipulated and managed or those parameters that can be used to gauge habitat development and ecosystem function (Thom et al. 2010). Protocols for collection and analyses of monitoring data would be developed for the level of accuracy necessary to assess achievement of performance criteria and inform adaptive management.

2.7.7.2 Adaptive Management

Successful adaptive management would first require baseline monitoring in order to fill data gaps and refine the restoration design. Consistent with the U.S. Department of Interior Technical Guide for Adaptive Management (2009), an adaptive management plan would be prepared prior to program implementation to track restoration success relative to performance criteria and determine when criteria have been met, and then restoration would proceed to its next phase. Performance criteria would be set for both biotic (e.g., native and non-native plant cover, wildlife use, etc.) and abiotic (e.g., hydrology, soil conditions, etc.) factors, and monitoring data related to these factors would inform adaptive management.

Triggers for any remedial adaptive management actions would be based on significant deviation from, or a lack of progress toward, achieving the performance criteria outlined for each monitoring parameter, coupled with an evaluation of the trajectories of habitat development or directions of change. For many aspects of biotic community development, it may take several years for trends to become apparent, and changes in management should allow for sufficient time for trends to become apparent. If it is determined that progress toward performance criteria is not measurable, or that the habitat appears to be progressing toward an alternative state, the project team would evaluate the cause of the problem and the trajectory of habitat development, and determine whether intervention would be desirable.

In some cases, habitat development would be on track to meet long-term performance criteria and no remedial actions would be warranted. In other cases, it may be determined that additional monitoring parameters are necessary to determine the cause of poor performance. Once the causes of poor performance are identified, appropriate changes in management would be investigated and implemented. Any modifications implemented as a result of this process would be subject to quantitative monitoring and analysis specifically designed to evaluate the effectiveness of such modifications or changes in management.

2.7.8 Operation and Maintenance Activities

2.7.8.1 Habitats and Vegetation

The restored areas would be planted or seeded after earthmoving finishes. Vegetation maintenance, irrigation, and weeding would be required for all habitats after restoration. Removal of invasive species would occur on site in perpetuity through the combination of a volunteer program and long-term management of the site using methods similar to those used during implementation.

2.7.8.2 Trash Removal Efforts

Trash removal would occur as needed within the restored wetlands by hand. LACFCD operates and maintains trash booms and nets in other flood control channels and a similar boom/net could be installed upstream of the Central Area across the San Gabriel River. If a trash boom/net was installed, it is anticipated that LACFCD or LCWA would inspect the trash net weekly and remove trash from the boom/net as necessary. Alternatively, a trash net could be installed across the breach into the Central Area.

2.7.8.3 Perimeter Levees and Berms

The Perimeter Levee and berms would require limited maintenance, such as inspections annually and after significant storm events (i.e., 10-year event or greater). The levees would also require periodic repaving of the access road and trail, replacement or repair of installed fencing, replacement or repair of any overlook or educational equipment placed along the walking trail, trash collection and graffiti removal, and any other vandalism repair. Minor erosion prevention measures may be needed for both the levees and berms, periodically. It is anticipated that responsibility for operation and maintenance activities would be allocated between LACFCD and LCWA.

2.7.8.4 Flood Walls

Operations and maintenance of flood walls would be determined along with the structure design and approval process. As part of this process, the entity responsible for the flood control facility and its function would be identified. Monitoring of the flood wall for deterioration would consist of regular and post-flood condition assessments. The condition assessments would also consider the ground in the vicinity of the flood wall, and identify any signs of instability, cracking, seepage, erosion, etc. Regular surveys could be desired to confirm that the structure settlement is within expectations and rotations and deflections are within tolerances. Exposed steel would require painting, and concrete cracks and spalls would be repaired.

Monitoring and maintenance of levees and flood walls is required, and hence access for construction equipment is an important design consideration. Also, dryside (e.g., the side of the wall closest to the roads) groundwater and drainage control are required. These elements are represented by the access road and bioswale components in Figure 2-24.

Access from the dryside to the wet side (e.g., the side of the wall closest to the marsh) by vehicles including construction equipment would require gates or an embankment or bridge.

2.7.8.5 Water-Control Structures

The existing culverts from the San Gabriel River are operated and maintained by LACFCD (USACE 1999). Operation and maintenance of the existing culverts would continue after restoration.

The existing siphon from Alamitos Bay to the Haynes Cooling Channel is owned and operated by LADWP. Once the Haynes Cooling Channel is decommissioned, it could be transferred to the LCWA, in which case, the LCWA would be responsible for operation and maintenance. This would likely include regular inspections and general maintenance. Long-term management of sediment and fouling organisms may also be required to maintain tidal flow.

For new water-control structures, annual maintenance would be needed to ensure proper operation, similar to current operation and maintenance of the existing structures. Gates and weirs may be adjusted seasonally for habitat management. Obstructions would be removed when necessary. If sedimentation in the channel limits the functionality of the water-control structures, a low ground pressure excavator would be used to remove the sediment. A temporary access route, 35-feet wide, would be created using mats to provide equipment access.

2.7.8.6 Stormwater Management Features

Maintenance of bioswales is expected to be limited to non-native vegetation removal and pruning, as needed. Non-native plant removal would include work with hand tools such as shovels, rakes, hatchets, wheel barrows, and small trucks for hauling of equipment and spoils. It is expected that these efforts would occur once a year for the lifespan of the program.

2.7.8.7 Parking Lots

Hours of operation for public use of the new parking lots, trails, and visitor center would be from sunrise to sunset and may be limited in duration. Parking areas would be locked after hours.

2.8 Required Approvals

LCWA intends to use this PEIR to consider implementation of the proposed Los Cerritos Wetlands Restoration Plan. As the Lead Agency, LCWA may use this PEIR to adopt the proposed Los Cerritos Wetlands Optimized Restoration Plan, make Findings regarding identified impacts, and, if necessary, adopt a Statement of Overriding Considerations regarding these impacts. Subsequent to the preparation of this PEIR, LCWA may develop more detailed designs that would serve to implement the proposed program activities described in Section 2.7, *Program Characteristics*. As individual restoration projects are fully developed, LCWA would conduct CEQA analysis for individual projects as appropriate or may determine that no additional CEQA analysis is required. Oil operators would prepare separate CEQA analysis once they elect to change or close their operations.

Restoration activities associated with the more detailed design would require discretionary approval from multiple agencies. These agencies and their permits/approvals are described in **Table 2-18, Required Permits and Approvals**. The specific permits/approvals necessary for each project activity will vary depending on the nature and location of the activity.

TABLE 2-18
REQUIRED PERMITS AND APPROVALS

Approving Agency	Approval
Los Cerritos Wetlands Authority	Certification of the Final PEIR, adoption of the Mitigation Monitoring and Reporting Plan, easements, land exchange agreements, purchase and sale agreements
City of Seal Beach	Site plan review, grading permits, building permits, encroachment permits
City of Long Beach	Site plan review, grading permits, building permits, local coastal development permits, encroachment permits
City of Los Angeles Department of Water and Power	Encroachment permits
Los Angeles County Department of Public Works and Flood Control District	Encroachment permits
Sanitation Districts of Los Angeles County	Construction permit
Orange County Public Works	Encroachment permits
South Coast Air Quality Management District	Permits to construct and operate
Santa Ana Regional Water Quality Control Board	Permits to construct and operate
Los Angeles Regional Water Quality Control Board	Section 401 Permit, National Pollution Discharge Elimination System, Storm Water Pollution Prevention Plan
California Department of Fish and Wildlife (CDFW)	Section 1602 Streambed Alteration Agreement
California State Lands Commission	Encroachment permits
Caltrans	Encroachment permits
California Coastal Commission	Coastal Development Permit in City Seal Beach Consolidated Coastal Development Permit in City of Long Beach
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permit, Rivers and Harbors Act Sections 9 and 10 Permits, Clean Water Act Section 408 Permit
U.S. Fish and Wildlife Service and National Marine Fisheries Service	Endangered Species Act Section 7 Consultation

Discretionary permits, reviews, and approvals are potentially required for proposed program implementation. This does not necessarily represent a comprehensive list of all possible discretionary permits/approvals required. Other additional permits, reviews, or approvals may be required for the proposed program. LCWA will work closely with all of the approving agencies to maintain communication and coordination throughout the implementation of program activities and receipt of the various permits/approvals.