FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX I: PLANNING AID REPORT; COORDINATION ACT REPORT

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers ®

Port of LONG BEACH THE PORT OF CHOICE

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PLANNING AID REPORT

U.S. FISH AND WILDLIFE SERVICE
30 JUNE 2016

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-LA-15B0128-16CPA0091-E00880

June 30, 2016

Colonel Kirk Gibbs
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Lawrence Smith

Subject: Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California

Dear Colonel Gibbs:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe issues and opportunities related to the conservation and enhancement of fish and wildlife resources. The project, as proposed, would involve dredging and deepening portions of the Port of Long Beach (Port), Los Angeles County, California. The purpose of the proposed project is to improve transportation efficiency and safety at the Port for large ships.

The proposed project area would involve portions of the Los Angeles County coast of the eastern Pacific Ocean, within about 3 miles seaward of the historic coastline near the mouth of the Los Angeles River. These existing marine and estuarine areas have been heavily modified over the last century associated with development of Long Beach Harbor/Port of Long Beach and nearby civil engineering and commercial/urban development. Most of the direct project footprint would occur within the boundaries of the Port; exceptions include proposed modifications to portions of the Pier J ship approach area (Corps 2016) and potential (currently undetermined) dredge material disposal areas, both of which are outside the Port harbor district area. The project area is located south of the City of Long Beach and east of the community of San Pedro and the Port of Los Angeles. The depths, widths, and volumes of dredge and disposal material associated with the proposed project are currently undetermined.

This PAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq*.), the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq*.), and the scope of work agreed upon by the Corps and the Service. This PAR does not constitute the report of the Secretary of the Interior as required by section 2(b) of the FWCA, nor does it constitute a biological opinion under section 7 of the ESA.

The purpose of this PAR is to deliver recommendations for use by the Corps design team in developing goals, objectives, and alternatives for the project.

In October 2015, the Council on Environmental Quality released Memorandum M-16-01 for Executive Departments and Agencies entitled Incorporating Ecosystem Services into Federal Decision Making. The memorandum recognizes that nature provides vital contributions to human economic and social well-being that are often not traded in markets or fully considered in decisions. It directs Federal agencies to incorporate ecosystem services into Federal planning and decision making,[1] and to develop, institutionalize, and implement policies to promote consideration of ecosystem services in planning, investments, and regulatory contexts. Additionally, it calls for integration of assessments of ecosystem services into relevant programs and projects, in accordance with the agency's statutory authority.

In November 2015 the White House released a Presidential Memorandum entitled Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. This memorandum underscores the importance of effectively mitigating adverse impacts to land, water, wildlife, and other ecological resources (EPA 2016). It orders five federal agencies, including the Departments of the Interior and Defense, to streamline regulations for offsetting environmental harm and to promote mitigation efforts. The memorandum establishes a national policy "net benefit goal" for natural resource use from projects. The memo seeks to unify natural resource mitigation goals across agencies; at a minimum, the memorandum calls for "no net loss" of land, water, wildlife and other ecological resources from federal actions including permitting; this extends the no-net-loss national policy standard for wetlands established by the President in 1989. The memorandum also directs that compensatory mitigation is now national policy (White House 2015); the memorandum was designed to ensure consistency and transparency as agencies across the Federal government develop mitigation measures (Bean 2016). Concurrent with the release of the November 2015 Presidential Memorandum, the Department of the Interior issued formal policy and guidance to its bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under its jurisdiction, using the best available science (Bean 2016). When assessing appropriate mitigation options, the Service relies upon a long established general mitigation hierarchy – first seeking to avoid impacts, then minimizing them, and then compensating for unavoidable impacts that could impair resource functions or values (Bean 2016).

As of March 2016, the Corps is preparing the Port of Long Beach Deep Draft Navigation Project Feasibility Study. The Corps is currently scoping project alternatives and will likely prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the project. This feasibility study phase of the project would likely conclude with the distribution of the Draft EIS/EIR for public review, reportedly scheduled by the Corps for 2018 (Corps 2015).

Repeated dredging is often necessary to maintain operations of many marine harbors. The dredging proposed herein would be implemented to increase the design water depths within the Port for ship

[1] Broadly defined, ecosystem services are the benefits that flow from nature to people, e.g., nature's contributions to the production of food and timber; life-support processes, such as water purification and coastal protection; and life-fulfilling benefits, such as places to recreate.

navigation purposes for very large ships (as compared to regular maintenance dredging). Harbor dredging often has effects on the marine environment, and dredged material disposal may affect water quality, mobilize contaminants, and bury or alter habitats, bathymetry, and physical processes (NOAA 2014).

Introduction

Vessels of increasingly larger size and deeper drafts[2] have been entering U.S. ports over the last decade-plus (NOAA 2015). The proposed project would be another increment in a series of dredge-and-fill projects over the last several decades that have modernized and reshaped the Port. This project would deepen water depths for access and navigation of very large ships within the Port. The latest generation of large cargo ships being built is twice the size of those that entered the global fleet only 15 years ago; these ships are now calling at the Port (Port 2016). These larger ships are reportedly more cost effective for ocean carriers and decrease transportation diesel consumption (Port 2016). These massive vessels, some with capacity of 14,000 Twenty-foot Equivalent Units (TEUs),[3] can be up to 1,200 feet long (Port 2016). Long Beach is one of only a handful of ports in North America capable of accommodating these larger ships, per the following features (Port 2016):

1. Deep-water main channel;
2. Deep-water terminals;
3. Berths designed to handle vessels that can exceed 156,000 tons fully loaded; and
4. Cranes that can move containers stacked 180 feet high and 24 boxes wide.

A century of harbor dredging and filling associated with development of the Port of Los Angeles and the Port of Long Beach has eliminated thousands of acres of the historic Wilmington Lagoon/Los Angeles River Estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Pacific Rim trade is increasing, along with the size of the some of the associated ships entering U.S. ports. The Port is a major center of international commerce on the west coast of the United States. Development of a permanent industrial base within the Port was gradual and began with increased harbor improvements and transportation in the early 1900s. It is the second-busiest container port in the United States, after the adjacent Port of Los Angeles. The Corps, in conjunction with the Port, are now examining options to provide additional channel depths to allow very large ships (with greater drafts than those that can currently be effectively accommodated) into the Port.

[2] The draft of a ship's hull is the vertical distance between the waterline and the bottom of the hull or keel.
[3] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The FWCA was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted in 1934, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act of 1969 (NEPA) (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be "supplementary legislation" to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. The FWCA authorizes the project implementation of means and measures for both mitigating losses of fish and wildlife resources, and for enhancing these resources beyond the offsetting of project effects (Smalley and Mueller 2004).

Project Area History

In 1542, Juan Rodriquez Cabrillo "discovered" the "Bay of Smokes" that is now called San Pedro Bay, describing it from offshore aboard ship. The smoke he described above the bay may have originated from the several Native American villages that existed near the bay along the Los Angeles River at the time. Much of the south-facing San Pedro Bay along the coast was originally a shallow estuary and mudflat (see Figures 1 – 3).

The area currently occupied by the ports of Los Angeles and Long Beach formerly included several undeveloped islands, and likely included barrier beaches and beach/river-mouth sand spits. These islands and spits likely included unvegetated beach and open areas that historically supported what are now sensitive species, including California least terns [*Sternula antillarum browni* (*Sterna a. b.*);[4] least tern] and western snowy plovers [*Charadrius alexandrinus nivosus* (*C. alexandrinus n.*); snowy plover].[5] The area of the northern San Pedro Bay was originally largely a marsh, with the Los Angeles River and the Bay sharing a common opening into the ocean.

In 1899 construction of the San Pedro Bay breakwater began near the project area. In 1906, the Los Angeles Dock and Terminal Company started development of Long Beach Harbor by purchasing 800 acres of sloughs and salt marshes associated with the Los Angeles River mouth estuary — an area that later became the inner portion (Inner Harbor) of Long Beach Harbor. In 1907, construction began on the Craig Shipyard in the Inner Harbor; the Craig Shipyard Company was also awarded a contract to dredge a channel from the open ocean to the new Inner Harbor. In 1911, the State of California (State) granted the tidelands areas of what is now the Port of Long Beach to the City of Long Beach (City) for port operations.[6] These tidelands were granted to the City in trust for the people of the State. This tidelands trust not only restricts the use of the tidelands, but the tidelands and tidelands-related revenues of the Port must be used for purposes related to harbor commerce, navigation, marine recreation, and fisheries. The Port currently includes more than 7,600 acres of wharves, cargo terminals, roadways, rail yards, and shipping channels, and is one of the world's busiest seaports (see Figure 3).

An 8.5 mile-long breakwater made of three rock segments stretches across most of San Pedro Bay, with two openings to allow ships to enter the harbor areas of the Ports of Los Angeles and Long Beach behind it. The initial western section of the breakwater, called the San Pedro Breakwater, was constructed between 1899 and 1911 at San Pedro; the Middle Breakwater was completed from 1911 to 1936, and the Long Beach Breakwater was completed after World War II. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively (Long Beach 2009).

The Los Angeles River is a major river and flood management waterway for the Los Angeles watershed basin. In the 1930s, the Army Corps began channelizing the river for flood damage reduction and by 1954, the entire length of the river was channelized (Long Beach 2009).
The river is now maintained by the Corps and the Los Angeles County Department of Public Works (Long Beach 2009). The Los Angeles River continues to discharge into San Pedro Bay at the northeastern edge of the proposed Project Area.

Considerable changes have occurred in the two ports since the 1970s. Some of these changes included deepening of navigational channels and basins; construction of substantial landfills at Piers 300 and 400 in the Port of Los Angeles; construction of a transportation corridor out to Pier 400; expansion of Pier J in the Port of Long Beach; and construction the west basin of the Cabrillo Marina

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[4] The California least tern was originally and remains federally- and California State-listed under the generic name of *Sterna antillarum browni*; this original name is now otherwise invalid. The American Ornithologists Union in 2006 changed the valid generic name of the least tern to *Sternula*, with the California least tern then becoming *Sternula a. b.*) (Service 2016).

[5] California least terns typically nest in colonies on relatively open beach areas that are free of vegetation and are near fish prey (Service 2006). Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting western snowy plovers (Service 2007).

[6] Tidelands in California are defined as those lands and water areas along the coast of the Pacific Ocean seaward of the ordinary high tide line to a distance of three miles.

complex. As part of mitigation for construction and channel deepening, shallow water habitats were created in formerly deepwater areas near Pier 300, near the San Pedro Breakwater, and on the east side of Pier 400. Thus, several areas that were previously aquatic natural communities are now developed land areas, some former deep water areas are now shallow, and water circulation patterns within the Ports have been substantially altered.

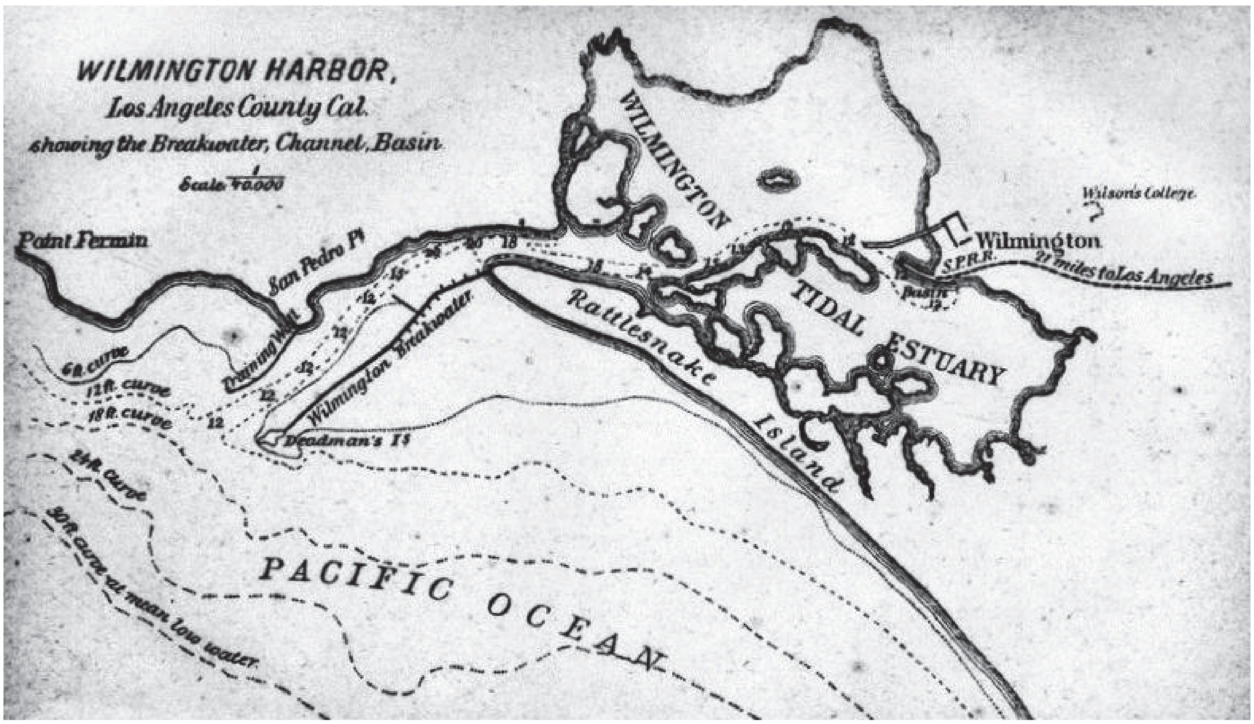

Figure 1. Circa 1880 drawing of Wilmington Harbor. The Future Port of Long Beach is on the east (right) side of the “Wilmington Tidal Estuary.” “Rattlesnake Island” would later be expanded to become Terminal Island within the ports of Los Angeles and Long Beach. Wilmington Harbor would later become the Port of Los Angeles. Note the water depths indicated. (Water Power and Associates 2014)

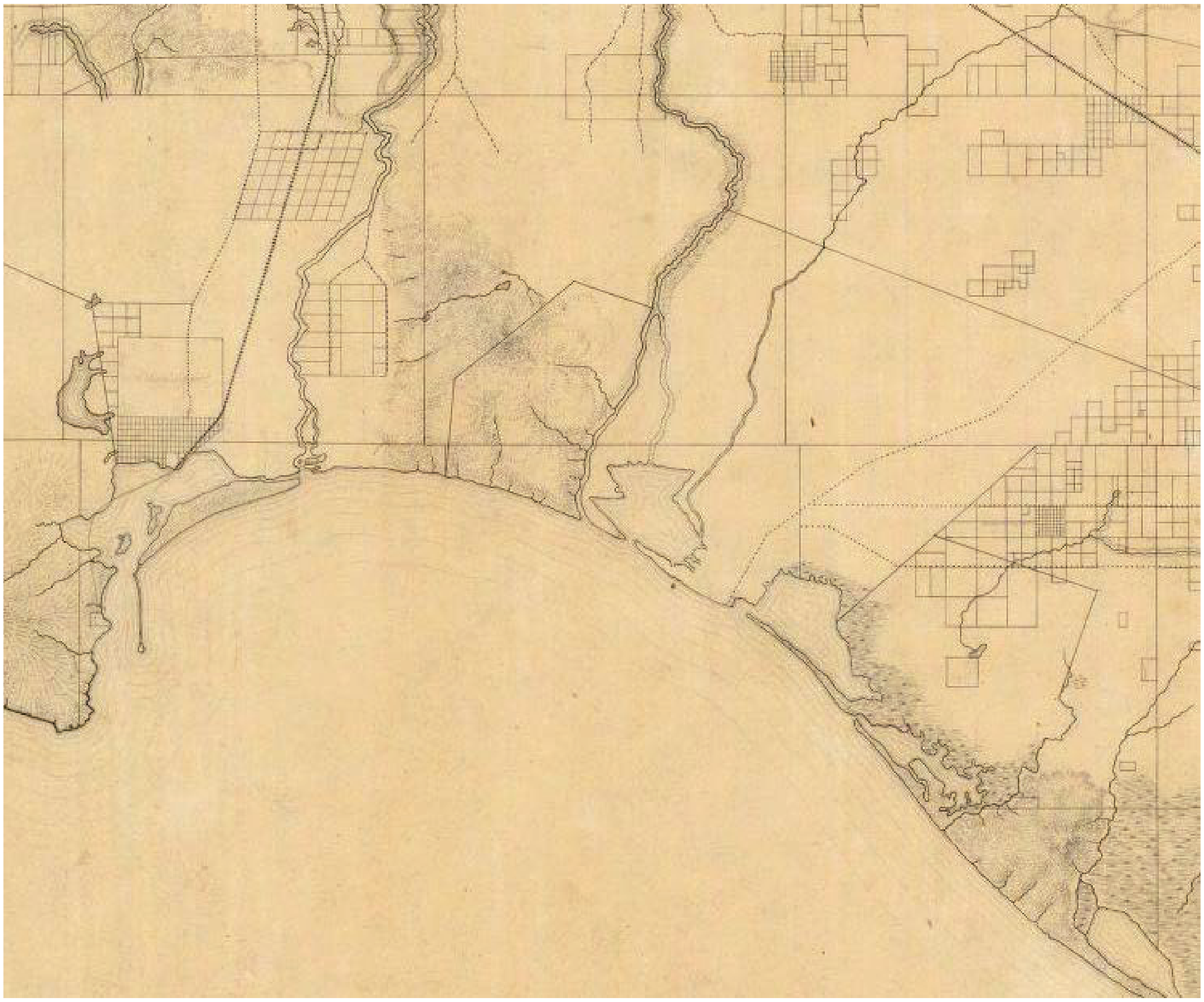

Figure 2. Portion of a circa 1880 drawing by William H. Hall of Los Angeles showing the San Pedro Bay coastline, estuaries, and ocean contours (Hall 1880). The future Port of Long Beach is in the center-left of the drawing.

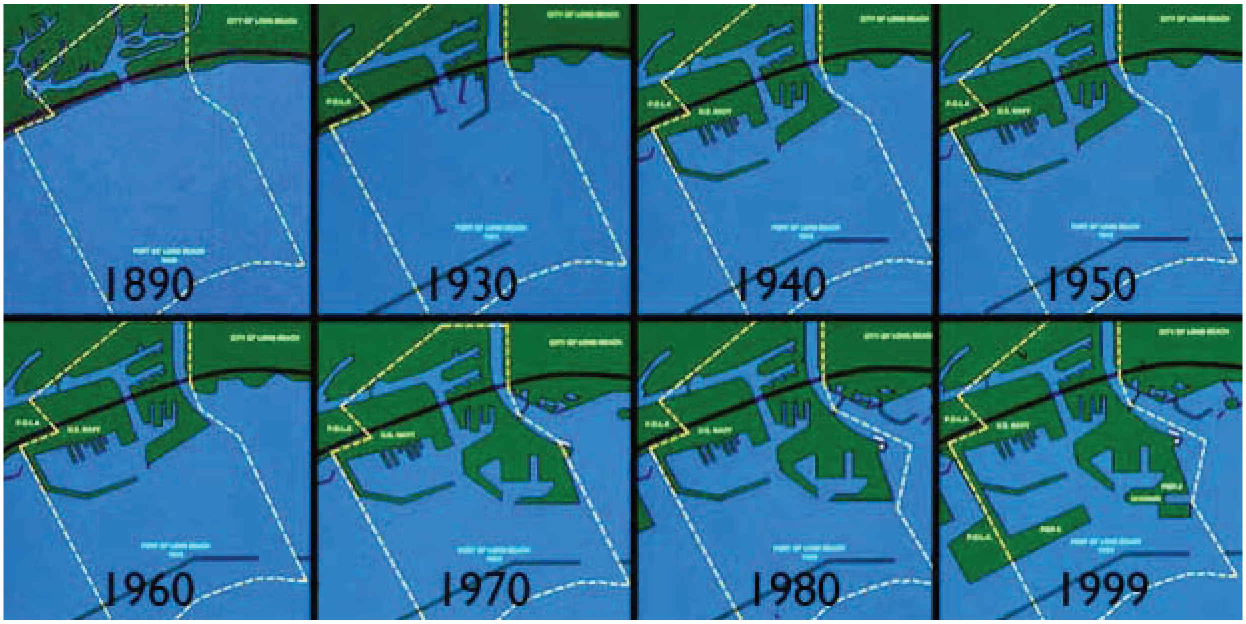

Figure 3. Drawings showing development progression of the Port since 1890 (Port 2014).

Description of the Project Area

The main project site is the Port of Long Beach and is located on the Pacific coast of southern California in western San Pedro Bay, at the southern end of the City, in southern Los Angeles County. The Port is less than 2 miles southwest of downtown Long Beach and about 25 miles south of downtown Los Angeles. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east is the community of Seal Beach. Other areas that could be included in the Project area are local beaches or the open ocean for dredge disposal; the project dredge disposal areas are currently undetermined.

Two competing and independent commercial ports, the Port of Los Angeles and the Port of Long Beach, share the San Pedro Bay marine ecosystem. These man-made harbors have been created through over a century of dredging and filling of the former 3,450-acre Wilmington Lagoon and surrounding areas. The Port of Los Angeles and Port of Long Beach encompass 7,500 acres and 7,600 acres of land and water, respectively. The Port consists of: 3,000 acres of land, 4,600 acres of water, 10 piers, and 80 berths. Uses within both ports are largely industrial, although a variety of other uses (e.g., recreation, commercial fishing) are also supported.

The Port of Los Angeles and Port of Long Beach are both considered deep-water constructed ports, and do not have siltation problems like ports located in natural rivers (natural river ports) (LA/LBHSC 2016). The vast majority of sediments deposited in the ports are carried by the Los Angeles River, Dominguez Channel, and several smaller local creek/storm drains (LA/LBHSC 2016). Due to the region's Mediterranean climate, these channels carry significant quantities of storm water on rare occasions during the winter, and most of the silt settles out near the inlet mouths (LA/LBHSC 2016). As such, the ports need only to be dredged occasionally to maintain berth side design water depths (LA/LBHSC 2016).

The Port has 65 deep-water berths; all of these berths lay within three miles of the open sea, and are reached via the Port's Main Channel which has depths of minus 76 feet at Mean-Lower-Low-Water (MLLW) (LA/LBHSC 2016). The maximum ship draft in the Main Channel is currently limited to 65 feet (LA/LBHSC 2016). Dredging outside the Long Beach Breakwater Entrance Channel has deepened that area to minus 76 feet at MLLW (LA/LBHSC 2016). The Port is currently engaged in a capital development program (CDP) that includes but is not limited to dredging, terminal redevelopment, transportation, and public safety projects (LA/LBHSC 2016). Major components of the CDP include capital dredging in the West Basin and Inner Harbor Turning Basin, and in-water fill within the East Basin (LA/LBHSC 2016). The CDP includes the Middle Harbor Redevelopment Program, the replacement of the Gerald Desmond Bridge spanning the Back Channel, several rail infrastructure projects, and proposed security operations and support facilities (LA/LBHSC 2016). Though not a Port project, Caltrans is currently engaged in the replacement of the Commodore Schuyler Heim Bridge (SR-47) spanning the Cerritos Channel; it will be converted from a lift bridge to a fixed bridge (LA/LBHSC 2016).

Port of Long Beach Water Depths (LA/LBHSC 2016):

Federal Channels in the Port	Current Depth	Current Width
Main Channel	-76 feet	360 – 1500 feet
Back Channel	-52 feet	220 feet
Inner Harbor (Turning Basin)	-52 feet	960 feet
Cerritos Channel	-50 feet	325 feet
Channel 2	-37 to -55 feet	150 – 250 feet
Channel 3	-36 to -45 feet	150 – 200 feet

The outer limit of the Port is defined by breakwaters that were constructed during the early to mid 1900's (MEC 2002). The majority of the harbor waters within the Port currently range in water depth from 30 to 60 feet (MEC 2002) with navigation channels dredged to depths of 45 feet and greater (Service 2000). The adjacent Port of Los Angeles contains several hundred acres of waters currently shallower than 20 feet, primarily constructed by sub-aquatic fill of deeper areas performed to increase marine biological functions. The relative bathymetry[7] of the areas within and around the ports of Long Beach and Los Angeles can be seen in Figure 4.

[7] Bathymetry: the measurement of the depths of oceans, seas, or other large bodies of water, and the data derived from such measurement.

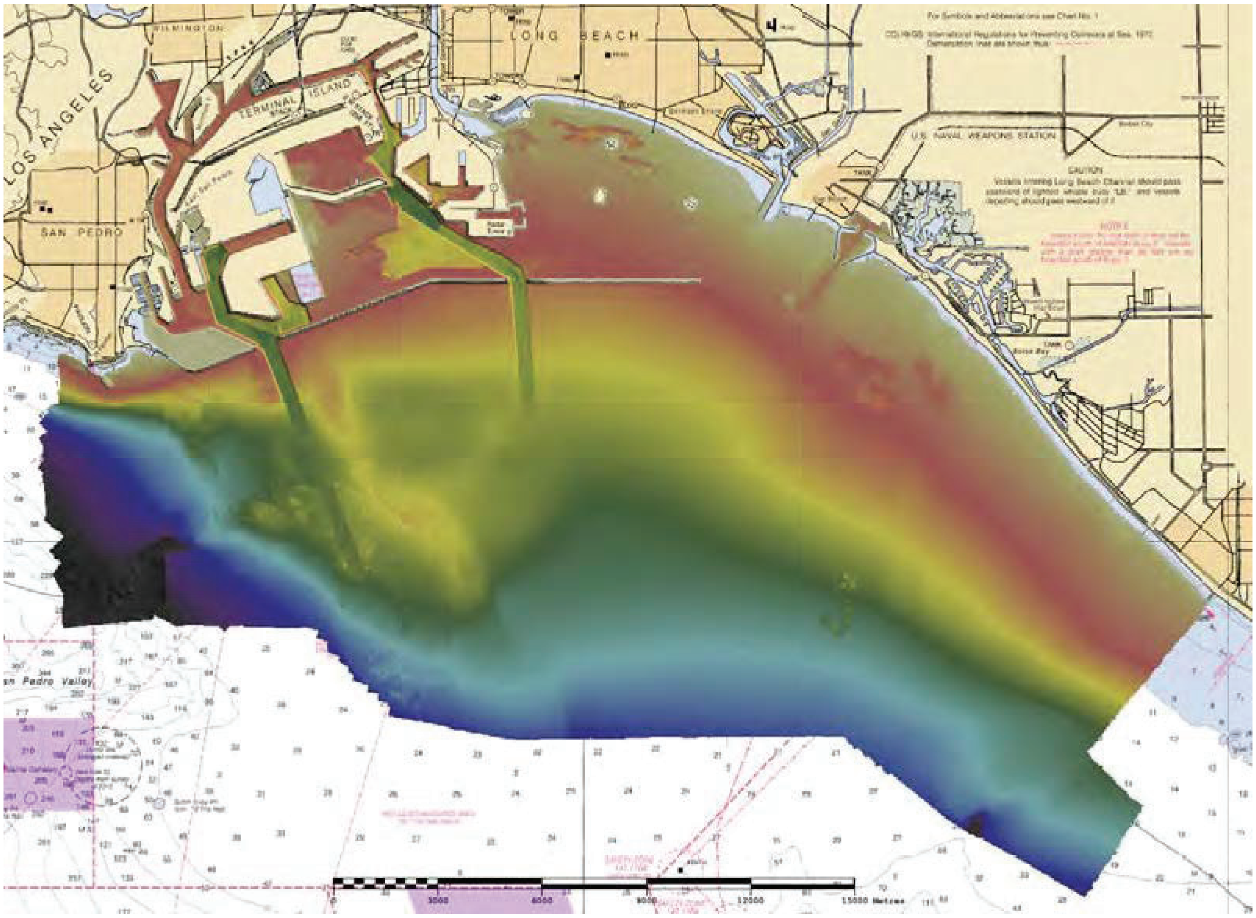

Figure 4. Relative bathymetry of the ports of Long Beach and Los Angeles and environs to highlight the deeper waters in the ports. (NOAA 2015)

Corps Study/Project Area

The Corps' study area for the proposed project includes the waters in the immediate vicinity (and shoreward) of the Port breakwaters throughout most of the Port, and the upstream reaches of the Los Angeles River that have direct impact on the San Pedro Bay, as well as the entire Port facility, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (Corps 2015). The Corps' current Project Area is shown in Figure 5 (Corps 2016).

Project Description

The Corps, with the Port as the local sponsor, is considering the feasibility of deepening navigation channels within the harbor to increase water depths necessary to accommodate deeper draft ships in the Port. The proposed channel depths and methods to accomplish this are currently undetermined. The proposed project's proposed footprint areas are shown in Figure 5. Additional details regarding work areas have not been provided to the Service. Other project footprint areas could include areas within and/or outside the Port for dredge material disposal.

Figure 5. Corps Draft Project Area and Areas of Interest (Corps 2016)

The proposed project would require disposal site(s) for dredge materials. These sites are currently undetermined, but are expected to potentially include sites within the Port area, open-ocean, and/or nearby beach areas, depending in-part on sediment qualities and contaminant constituents in dredge materials (as determined through the testing requirements in 40 CFR §230). Re-use of dredge materials for sand replenishment on beaches near the Port is often desired by the Corps and locals where sediments are appropriate.

Background

The Port has undergone significant development and expansion in the past century (Corps 2015). In the last three decades, the ports of Los Angeles and Long Beach have undertaken accelerated long-range development efforts to increase the shipping and commercial capacity of the ports; both of the ports have become major transportation and trade centers. International commerce is almost 20 percent of the U.S. gross domestic product, and about 95 percent of these products arrive or leave the country in ships (Gray 2001). The Port provides the shipping terminals for nearly one-third of the waterborne trade moving through the west coast of the United States (Corps 2015).

The Port of Long Beach and the Port of Los Angeles are ranked sixth and eighth in tonnage in the United States respectively, moving a combined 139.2 million metric tons (DOT 2012). Trade currently valued annually at more than $155 billion moves through the Port, making financially it the second-busiest seaport in the United States (Corps 2015). To handle this high volume of trade, Port facilities include 10 piers, 80 berths, and 66 post-Panamax gantry cranes (Corps 2015). The Port has 22 shipping terminals to process break bulk (e.g., lumber, steel), bulk (e.g., salt, cement, and gypsum), containers, and liquid bulk (e.g., petroleum) (Corps 2015). Each year the Port handles more than 6 million Twenty-foot Equivalent Units (TEUs)[8] and 75 million tons of cargo, and has over 2,000 vessels call (Corps 2015). Items from clothing and shoes to toys, furniture and consumer electronics arrive at the Port before making their way to stores throughout the country (Corps 2015). Specialized terminals also move petroleum, automobiles, cement, lumber, steel and other products (Corps 2015). The Port's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port (Corps 2015). Top imports are crude oil (16 million metric tons annually), electronics, plastics, and furniture (with inbound container tonnage on the order of 22 million tons annually), while top exports are petroleum products, chemicals, and agricultural commodities (Corps 2015). Currently, about one-third of liquid bulk and container cargo by weight is transported on vessels that could potentially experience operating constraints associated with the current channel depths in the Port (Corps 2015).

Under keel clearance for larger ships in the Port is important in terms of the depth of the seafloor and the static draft of the vessel transiting above it (NOAA 2015). This takes into play many elements: water level is the most obvious and important contributor to this equation. The term "tide" captures the astronomic contribution of the rise and fall of the sea's surface, whereas water level takes into account weather effects and riverine runoff contributions (NOAA 2015). In addition to the water levels, the other factors that must be considered include meteorological conditions, the vessel's motion induced by the prevailing sea state, the static draft of the vessel, the variation in this draft due to the vessel's motion through the water (dynamic draft), and the chemical composition of the water the vessel is sailing in, primarily salinity (NOAA 2015).

The large sizes of the many new trade ships are outsizing some of our waterways. Some Ultra Large Crude Carriers (ULCCs) entering the Port of Long Beach are carrying more than a million gallons of crude oil and are loading to drafts of 65 feet (NOAA 2015). Depending on the sea state in the approach channels of the Port, the ship's pitching may bring the hull close to the Port channel floor (NOAA 2015).

The channel leading into the Port of Long Beach currently has an authorized depth of 76 feet and local regulations allow drafts of 69 feet for ships with a displacement of up to 420,000 tons (NOAA 2015). In late 2012, at a Harbor Safety Committee meeting for the ports of Los Angeles and Long Beach, the Jacobsen Pilots[9] noted that during storms and long period swell conditions outside of the breakwater, ULCCs demonstrated significant levels of pitch[10] in high wave situations (NOAA 2015).[11] As a result, the Captain of the Port froze the maximum draft at 65 feet until they understood the effects of the swells on the ULCCs and could better predict their behavior (NOAA 2015). The effect

[8] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).
[9] Jacobsen Pilots is the sole ship piloting company for the Port of Long Beach.
[10] Pitch is the up/down rotation of a vessel about its lateral/Y (side-to-side or port-starboard) axis.
[11] As a point of reference, a 1,000-foot vessel pitching just 1 degree will experience an increase in draft of more than 10 feet (NOAA 2015).

of reducing the allowed under keel clearance means that ULCCs must wait outside of the sea buoy until conditions are favorable to make the transit into the Port of Long Beach, or lighter to another vessel in order to reduce their draft; both are expensive delays (NOAA 2015).

Presently the largest containerships dock primarily at one of two piers—Pier J or Pier T West Basin (Corps 2015). Access to south berthing area of Pier J is through a secondary channel connected to the Long Beach main access channel; that secondary access channel limits drafts to about 43 feet (Corps 2016). Access to the northern berthing area of Pier J is off the Southeast Basin and does not have this depth limitation (Corps 2016). About 20 years ago a small share of container vessels had to restrict drafts, utilize tides, or both (Corps 2015). However, the impact to operations has increased in the past few years due to the increasing share of larger containerships calling on the port (Corps 2015). Today containerships docking at south berthing area of Pier J have maximum operating drafts of 52 feet and over 7.5 million of the 36.6 million tons of container cargo in 2012 was handled by vessels at or near the 43-foot limit of the secondary access channel (Corps 2016).

Currently, light loading, and tidal delays increase transportation costs for goods transported on containers, and in the future the impact is expected to worsen (Corps 2015; Corps 2016). If sufficiently dredged, containerships with capacities of over 18,000 TEUs (e.g., 1300 feet long, 176 feet beam,[12] drafts approximately 52 feet) would be capable of operating fully loaded in the Port (Corps 2016). Thus, addressing operating constraints to containerships has the potential to significantly lower transportation costs (Corps 2015).

Through agreements with the Service and other resource agencies, the Port has restored some coastal wetlands in southern California in exchange for development approvals of various Port areas. The Port has participated in substantial wetlands restoration projects, including one at the National Wildlife Refuge in Seal Beach. In addition, the Port contributed $39 million toward acquisition of 267 acres of degraded wetlands in Bolsa Chica Lagoon (Bolsa Chica Lowlands Restoration Project) in Huntington Beach (Port 2015).

Project Goals and Objectives

The proposed channel deepening project would allow large, deeper draft ships access to terminals within the Port. The Corps' stated planning goal is to provide safe, reliable, and efficient waterborne transportation improvements to the Port that address problems and opportunities as outlined herein. The Corps' planning objectives are specified as follows:

1. Reduce the cost of transporting cargo to and from the Port by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages; and

2. Reduce expected future vessel re-routings from the Port to alternate facilities by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages.

[12] The beam of a ship is its width at the widest point as measured at the ship's nominal waterline.

Description of Biological Resources

The Port of Long Beach represents a large harbor complex typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge maintained shipping channels (SAIC 2010). The fish and wildlife resources of the Port and San Pedro Bay are reported in substantial detail in a 2000 biological baseline report entitled "Ports of Los Angeles and Long Beach Year 2000 Biological Baseline Study of San Pedro Bay" (MEC 2002). This information was updated with additional survey efforts in 2008 in a report entitled "Final 2008 Biological Surveys of Los Angeles and Long Beach Harbors" (SAIC 2010). A brief summary of the available information is provided herein, based primarily on these two baseline reports. The biological resource groups of San Pedro Bay that are typically considered the most important are the marine fishes and water-associated birds.

The benthic hard substrates in the ports are mostly artificial breakwaters and barriers of riprap (boulders and concrete rubble), and constructed shallow water areas in the ports (LA/LBHSC 2016). Kelp beds typically dominate the hard substrates, with surfgrass natural community potentially existing in waters less than 10 feet deep (LA/LBHSC 2016). Soft bottom substrates comprise the majority of acreage in the two ports (LA/LBHSC 2016). No eelgrass beds were identified within the Port of Long Beach (SAIC 2010). One area just outside the Port's boundary line northeast of Island Grissom[13] was identified as supporting a sizeable eelgrass bed (SAIC 2010). The water column within the ports provides important habitats for many fish, larvae, and plankton, seals, and sea lions (LA/LBHSC 2016).

Fish

Fish populations of San Pedro Bay (including the ports of Los Angeles and Long Beach and environs) are diverse and relatively abundant (SAIC 2010). During surveys conducted in 2000, a total of 74 species were recorded and an estimated 44 million fish occupied the 2 ports. Surveys of the 2 ports in 2008 identified total of 62 fish taxa representing 59 unique species of fish (SAIC 2010). Generally, schooling fishes were the most abundant species recorded.

Northern anchovy (*Engraulis mordax*) and white croaker (*Genyonemus lineatus*) were the most abundant species collected in 2000 surveys; white croaker was top ranked in terms of biomass (MEC 2002). From 2008 surveys in the two ports, pelagic fish from lampara[14] net collections were dominated by four species: northern anchovy, topsmelt (*Atherinops affinis*), California grunion (*Leuresthes tenuis*), and Pacific sardine (*Sardinops sagax*). These species accounted for 98 percent of the total lampara net catch in 2008. All of these species are schooling fishes that spend most of their lives in the harbor environment. From 2008 otter trawl[15] surveys, dominant species included northern anchovy, white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), shiner surfperch (*Cymatogaster aggregata*), and white surfperch (*Phanerodon furcatus*). Other species

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[13] One of a set of four artificial oil production islands in San Pedro Bay off the coast of Long Beach.

[14] A lampara net is a type of fishing net used for capturing certain pelagic fish, those swimming near the water's surface.

[15] In otter trawling, a large net is dragged along the bottom or up in the water column behind a towing vessel. The mouth of the net is held open by two large "doors" which are attached to either side of the net. For the noted surveys performed in 2000 and 2008, trawl surveys were performed to capture bottom-dwelling demersal fish.

caught in high abundance were specklefin midshipman (*Porichthys myriaster*), California tonguefish (*Symphurus atricauda*), and yellowchin sculpin (*Icelinus quadriseriatus*).

The five most abundant species accounted for 92 percent of the total fish populations in the ports (MEC 2002). These included northern anchovy, white croaker, queenfish, Pacific sardine, and topsmelt. Other relatively abundant species included shiner surfperch, salema (*Xenistius californiensis*), and jacksmelt (*Atherinopsis californiensis*). Less numerous but ecologically and/or recreationally important species recorded were California barracuda (*Sphyraena argentea*), California halibut (*Paralichthys californicus*), barred sand bass (*Paralabrax nebulifer*), California corbina (*Menticirrhus undulatus*), white seabass (*Atractoscion nobilis*), California grunion (*Leuresthes tenuis*), and several species of sharks and rays.

In 2000, generally fewer species were caught in the Inner Harbor than Outer Harbor (MEC 2002). Benthic invertebrates, which represent an important food source for demersal fish,[16] also exhibited a trend of decreasing function of habitats from Outer to Inner Harbor areas (MEC 2002). In 2008 surveys, few differences were observed for pelagic fish between Inner and Outer Harbor areas, with Inner Harbor stations having between 4 and 12 species and Outer Harbor stations typified by between 3 and 11 species (SAIC 2010). This likely indicates that pelagic schooling species move throughout the harbor complex (SAIC 2010). In contrast, Outer Harbor areas generally were typified by a greater number, biomass, and variety of trawl-caught (demersal) fish than Inner Harbor areas (SAIC 2010).

More species of fish were collected in the shallow waters of the ports of Los Angeles and Long Beach, including all three of the created shallow water mitigation sites within the Port of Los Angeles, than at deepwater survey stations in open water, channel, basin, and slip habitats (MEC 2002). The greater diversity is likely partially explained by the greater heterogeneity associated with the shallow water habitats, which were adjacent to rock riprap and/or vegetated areas (e.g., eelgrass beds, kelp bed); this likely results in higher fish nursery function, greater production, and generally higher abundance of fish in shallow waters. For instance, the Cabrillo Shallow Water Habitat area is located alongside the San Pedro Breakwater, which supports giant kelp and other macroalgae; the Long Beach Shallow Water Habitat area is located adjacent to the riprap shoreline along Pier 400 that supports giant kelp and other macroalgae, and extensive eelgrass beds occur within the Pier 300 Shallow Water Habitat. Studies conducted in the shallow areas of the Outer Harbor, including the Pier 300 Shallow Water Habitat (MEC 1988, 1999) created in 1984 and the Cabrillo Shallow Water Habitat (MEC 1999) constructed in 1997, have shown that these areas have both higher diversity and greater abundance of fish and invertebrates than the deeper soft bottom portions of the ports of Los Angeles and Long Beach (MEC 2002). A greater abundance of juvenile fish is also present in these shallow areas; they appear to enter these areas relatively soon after hatching/birth. Long Beach fishing experts often fish adjacent to the four manmade oil production islands located within the overall Port boundaries,[17] due to the abundance of recreational fish found there; the abundance of recreational fish in these areas is reportedly due to shallow water combined with high relief from the riprap placed around the created islands (Ballanti 2007).

[16] Fish dwelling at or near the bottom of a body of water.
[17] The islands are controlled by the City of Long Beach and are not part of the Port’s Harbor District.

Forty-four unique species of fish larvae and 13 categories of fish eggs were identified in the ports of Los Angeles and Long Beach during the 2000 surveys (MEC 2002). The most abundant fish larvae were gobies [arrow goby (*Clevelandia ios*), cheekspot goby (*Ilypnus gilberti*), shadow goby (*Acentrogobius nebulosus*), and bay goby (*Lepidogobius lepidus*)], northern anchovy, California clingfish, queenfish, blennies, and white croaker. With the exception of the Pier 300 Shallow Water Habitat (in the Port of Los Angeles) that had high larval abundance and the Long Beach West Basin with low larval abundance, the abundances of larvae were generally higher on the Long Beach side of the two-port complex. This bears some similarity to the abundance pattern indicated for adult fish caught by lampara net surveys, which generally showed higher abundance in the deepwater channel, basins, and slips in the Port of Long Beach (MEC 2002). The larval catch was dominated by benthic associated gobies, which inhabit burrows. The ichthyoplankton surveys provided a good measure of the importance of species inhabiting burrows or associated with rocky and/or vegetated habitats in the Long Beach-Los Angeles port complex (MEC 2002). These species (while poorly represented in the adult fish surveys), are an important part of the overall ecology of the diverse marine habitats in the two ports. The ichthyoplankton results also demonstrate that a wide variety of fish spawn and develop within the ports of Los Angeles and Long Beach. Similar to the previous baseline study (MEC 2002), the only exotic (non-indigenous) fish species collected in the 2008 sampling surveys was the yellowfin goby (*Acanthogobius flavimanus*), collected at three Port of Los Angeles stations and six Port of Long Beach Harbor stations (SAIC 2010).

Benthic Invertebrates

Over 400 species of benthic infauna (small organisms that live on and within the sediment) and larger macroinvertebrates were collected during the Year 2000 Baseline Study; over 250 species of benthic infauna and larger macroinvertebrates were collected during the Year 2008 Baseline Study (MEC 2002; SAIC 2010). Small infaunal organisms (which tend to be less motile than larger macroinvertebrates) and larger macroinvertebrates both exhibited spatial variability in species composition that appeared to be tied to a combination of factors including water depth, years since dredging/disposal in the area, and ecological/habitats functions (MEC 2002). Studies in 2008 found little difference in species composition among deepwater stations located in basins, channels, or slips of the Inner and Outer Harbors (SAIC 2010).

Benthic invertebrate assemblages generally differed between shallow and deepwater habitats (SAIC 2010), and differences were apparent between assemblages from areas that have or have not experienced recent dredging (MEC 2002). Areas of recent dredging had fewer species and lower abundance than non-dredged areas, indicating that the recently dredged areas were still in the colonization phase (MEC 2002). Species assemblages of benthic invertebrates can be indicative of habitat function (SAIC 2010). Certain species are tolerant of adverse environmental conditions, such as low oxygen and high pollutant conditions, and others are found only in more pristine areas (SAIC 2010). In the 2008 study, species assemblages indicated that stations in the Outer Harbor had the highest habitat function as indicated by relatively greater abundance of species that typically characterize areas having background to low organic enrichment (i.e., low pollution) (SAIC 2010). The species assemblages found in the Inner Harbor, basins, and slips were indicative of low to moderate organic enrichment compared to the open-water Outer Harbor stations, suggesting that benthic invertebrate species composition is influenced by tidal circulation in the harbors, with Outer Harbor areas having greater circulation and higher functional habitats (SAIC 2010).

Non-indigenous invertebrates comprise about 15 percent of the infauna and macroinvertebrate species occurring in the ports, with some of these species representing numerical dominants (SAIC 2010). The relative abundance of these species has increased in the harbors since the 1970s (SAIC 2010). A total of 10 non-indigenous (introduced) and 32 cryptogenic species (of unknown origin) were identified among the 313 species of infauna and macroinvertebrates collected during the 2008 study (SAIC 2010). The overall percentage of introduced and cryptogenic species identified in the present study (14 percent) is similar to the 15 percent reported by MEC (2002) in 2000 (SAIC 2010).

In general, ecological/habitats function was highest for benthic invertebrates at the created Cabrillo, Pier 300, and Long Beach Shallow Water Habitat areas and the deep open waters of both ports (MEC 2002). A gradient of decreasing ecological/habitats function was observed in basin and slip habitats and the back channels of the Inner Harbor. Similar to fish, catch abundance was higher in basin habitats in the Port than in the open waters of the Outer Harbor (SAIC 2010). The lowest catch of benthic invertebrates was obtained in the Inner Harbor (SAIC 2010).

A steady improvement in benthic ecological/habitats function within the ports of Los Angeles and Long Beach over time has occurred, as demonstrated by increased diversity and less dominance by pollution tolerant benthic infauna species over the past half century. Many areas in both ports were severely polluted in the 1950s with depauperate benthic faunal assemblages in these areas during that period (MEC 2002) (please see Contaminants below).

Birds

Southern California's coastal areas, including its shorelines, estuaries, bays, and developed harbors, provide a variety of natural and artificial communities for large numbers of waterfowl, shorebirds, wading birds, and birds that forage from the air. The predominately open water and hardscape/landscape habitats within the ports of Long Beach and Los Angeles provide opportunities for nesting, foraging, and resting by a moderate diversity of bird species, including one species listed as endangered under the ESA, the California least tern.

Birds that occur in and near the ports of Los Angeles and Long Beach are primarily water-associated species; that is, they are dependent on the marine natural communities for food and other essentials. Over 100 avian species use the various habitats within the Ports seasonally, year-round, or during migration (SAIC 2010). The areas within and near the ports provide very limited areas of trees and/or shrubs for feeding, resting, and/or nesting; most of this small area of vegetation is made up of exotic landscaping. As a result of the high numbers of small fish in the shallow water areas of the ports, substantial numbers of fish-eating birds are found foraging in these areas. The ports provide high-function habitats for many foraging, resting, and breeding birds.

During the 2000-2001 monitoring year, a total of 99 bird species, representing 31 families, were observed within San Pedro Bay (MEC 2002). A total of 96 species representing 30 families were observed within the ports during the 2008 study (SAIC 2010). Of these species from both studies, 69 are considered to be dependent on marine habitats. Gulls comprised 44.5 percent of the birds observed in 2000, with aerial foragers (22.4 percent) and waterfowl (21.4 percent) also common. The remaining 21.7 percent of the birds were small and large shorebirds, wading/marsh birds, raptors, and upland birds. The most abundant birds included several gull species [e.g., Western (*Larus occidentalis*), Heermann's (*L. heermanni*), and California (*L. californicus*)], brown pelican (*Pelecanus occidentalis*), elegant tern (*Thalasseus elegans*), western grebe (*Aechmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicillata*), and rock pigeon (*Columba livia*).

The State and Federal endangered California least tern is a piscivorous (fish eating) sea bird that makes significant breeding use of San Pedro Bay (KBC 2005). The least tern has a long history of nesting on Terminal Island and Pier 400 in the Port of Los Angeles (Figure 4). Pier 400 is near the western portion of the proposed project footprint. This least tern nesting site is typical of those used by the species in highly developed coastal California; the site is a relatively flat, open, barren sandy area near the ocean where the least terns lay and incubate their eggs and chicks fledge. The least tern nesting period extends from April through August; along the California coast least terns typically begin to arrive (from wintering grounds) in the southern most colony breeding sites (e.g., San Diego) in early April and they continue to arrive through the later part of May. During the remainder of the year, the birds are gone from the area.

Least terns nest on sparsely vegetated substrates, including sandy beaches, salt flats, and dredge spoil, in colonies of a few to several hundred nesting pairs. This species relies on sight for foraging and usually requires relatively clear water to locate its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt (LSA 2009). Although there is some field evidence to suggest that least terns will forage in turbid waters to which fish are attracted, the majority of foraging occurs in clearer waters (LSA 2009).

The location of the tern nesting site(s) in the ports of Los Angeles and Long Beach previously varied from year to year (KBC 1998) depending largely on development activities in the ports, with most nesting on Pier 400. The Los Angeles Harbor Department manages the Pier 400 nesting site pursuant to a Memorandum of Agreement with the Service, Corps, and California Department of Fish and Wildlife (Department) (LA 2006). A 15.7-acre fenced nesting site is located at the southern tip of Pier. 400, although some nesting by least terns also often occurs outside of this designated area.

Least terns have nested within the ports since the late 1800s and have been observed within the harbor almost every year since annual monitoring studies began in the ports in 1973 (SAIC 2010). Since 1973 the least tern has utilized nesting locations on and around Terminal Island, with nesting at Reeves Field and/or Pier 300 and Pier 400 areas (LAHD 2015). Zero least tern nesting pairs were recorded for the Terminal Island area in 1992 (LAHD 2015). The greatest documented nesting activity for the least tern in the area has occurred since the birds began utilizing the then newly-constructed Pier 400 as a nesting site in 1997. The number of recorded nests at Pier 400 peaked at 1,322 in 2005, then declined to 906 in 2006, and further declined to 710 in 2007 (KBC 2007) and 126 in 2014 (State 2015). The principal foraging areas for least tern in the ports and environs vary somewhat from year to year, but during the chick rearing period, the shallow water areas of the ports are used heavily, probably due to the relatively greater abundances of appropriate prey fish (size and species) found there (see MEC 1988, 1999). Measures to protect the least tern during channel dredging and landfill construction projects have proven successful (Service 1992). Those measures have included nesting area and predator management, shallow water area conservation/creation, and protection of water quality in the shallow water areas during breeding season.

Least tern nest numbers at Pier 400 increased from approximately 565 during the 2000–2001 to 1,332 in 2005, and then declined to 521 in 2008 (SAIC 2010). The decrease in nest numbers is opined to be related to increases both in upland vegetation and predation at the Pier 400 nesting site (KBC 2008). The majority of least tern observations during 2007–2008 surveys were of individuals foraging or flying in the vicinity of the Pier 400 nesting site; least terns also were observed foraging along the outer breakwater and open-water areas of the Outer Harbor and within Inner Harbor basin and channel areas (SAIC 2010). Least terns foraged most frequently just off the Pier 400 nesting site, off Pier 300, and near Cabrillo Beach (SAIC 2010).

The brown pelican, formerly federally listed as endangered, is found in large numbers in San Pedro Bay (MEC 2002). This bird breeds on the offshore Channel Islands, and forages widely along the southern California coast on small fishes. Brown pelicans make heavy use of the Outer Harbor breakwaters for roosting. The brown pelican is present throughout the year. The peregrine falcon (*Falco peregrinus*), also formerly federally listed as endangered, nests on bridges within the area of the ports (SAIC 2010).

Several piscivorous seabirds began nesting in the adjacent Port of Los Angeles following construction of Pier 400. The royal tern (*Thalasseus maximus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and black skimmer (*Rynchops niger*) had each been recorded nesting on Pier 400 up until 2005 (KBC 2005). No nesting by these species was recorded in 2006 or 2007 (KBC 2007). The landfill area of Pier 400 (constructed in 1996) initially provided a large expanse of suitable bare-dirt nesting habitat for terns adjacent to a well-developed forage base (consisting of small fish) in the Outer Harbor. However, development of Pier 400 is now complete and undeveloped areas in the ports of Los Angeles and Long Beach outside of the Pier 400 nesting site currently contain very little suitable seabird nesting habitats.

No snowy plovers were detected within either the ports of Long Beach or Los Angeles during the 2007–2008 surveys (SAIC 2010). Snowy plovers are occasionally observed during migration at the California least tern nesting site on Pier 400 (SAIC 2010). A few snowy plovers have been observed at nearby Point Fermin and Cabrillo Beach (outside of the breakwater), both south and outside of the Port of Los Angeles (SAIC 2010).

Mammals

Most marine mammals are under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA Fisheries), including all those potentially occurring in or near the ports. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq*.) and some are also protected by the ESA. Marine mammals that are known to occur sporadically in waters of the ports include pinnipeds [California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*)] and cetaceans (SAIC 2010). Cetaceans that have been observed in outer harbor locations in the ports include the gray whale (*Eschrichtius robustus*), Pacific bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) (SAIC 2010). None of these are species are known to breed in the ports (SAIC 2010).

Riprap-Associated Organisms

A total of 334 species of invertebrates were identified from three tidal zones within the riprap community in the ports (SAIC 2010). Distinct tidal zonation was observed with increasing numbers of species with increasing depth. Mean total abundance was highest in the lower intertidal, lowest in the upper intertidal, and intermediate in the subtidal zone (SAIC 2010). Across all tidal zones, crustaceans were numerically dominant, followed by polychaetes, echinoderms, molluscs, and other phyla. Past studies have noted relatively greater community development in Outer Harbor compared to Inner Harbor areas (MEC 1988, 2002). However, the 2008 study noted general similarities in these communities throughout the two ports (SAIC 2010). Exceptions were for diversity, which was somewhat greater at Outer Harbor breakwater stations compared to Inner Harbor locations, but these differences were mainly associated with the upper intertidal zone (SAIC 2010). Community summary measures did not show distinct trends among Inner and Outer Harbor stations for the lower intertidal and subtidal zones, suggesting some improvement in ecological function at Inner Harbor stations since the 2000 study (SAIC 2010).

Kelp and Macroalgae

Within the ports, the majority of kelp and macroalgae surface canopy is closely associated with the outer breakwaters and with riprap structures in the Outer Harbor and in locations facing the port entrances (SAIC 2010). While algal diversity in the ports is considered relatively low, there is a general pattern of decreasing algal diversity from Outer to Inner Harbor locations (SAIC 2010). During the 2008 study, Macrocystis canopy in the two ports totaled 77.8 acres in spring and decreased to 50.4 acres in the fall (35% decrease) (SAIC 2010). Seasonal declines in kelp canopy cover for both studies are likely due to natural die-offs between winter and fall. Dominant macroalgal communities included the genera *Sargassum*, *Ulva*, *Colpomenia*, *Chondracnathus*, and *Halymenia* (SAIC 2010).

Occurrences of invasive exotic algae within the ports include the brown algae *Sargassum muticum* and *Undaria pinnatifida*. While *Sargassum* has become a commonly observed component of the algal flora in southern California, including the ports, *Undaria* was first reported in the United States in spring 2000 during the previous baseline study of the ports (MEC 2002). Notably, *Undaria* was documented during the present study at all eight Inner Harbor sites studied and at 7 of 12 Outer Harbor locations, indicating an expanded distribution since 2000 (SAIC 2010).

Contaminants

The marine biological environment of the ports of Los Angeles and Long Beach has been periodically studied since the 1950s. Early studies documented severe pollution in several of the basins in the harbors. As recently as the late 1960s, dissolved oxygen (DO) levels at some locations in Los Angeles Harbor were so low that little or no marine life could survive (SAIC 2010). Since that time, regulations have reduced direct waste discharges into the ports, resulting in improved DO levels throughout the port areas (MEC 2002; SAIC 2010). Comprehensive studies in the 1970s reported a dramatic improvement in marine habitats function/quality relative to the 1950s, although areas of pollution are still evident in Inner Harbor and blind-end slip areas (MEC 2002).

Results from studies in 2000 and 2008 indicate a continued trend of water quality improvement since the 1970s, with most DO concentrations in excess of 5 milligrams/liter (MEC 2002; SAIC 2010). Episodic and localized changes in some parameters, such as low DO concentrations coinciding with low transmissivity, suggested minor effects possibly associated with sediment resuspension events (MEC 2002). Water clarity (transmissivity) decreased with increasing depth and was relatively lower in bottom waters at stations with fine sediments and/or in the vicinity of dredging and/or disposal (MEC 2002). Polluted and “semi-healthy” areas still exist in the ports; however, the spatial extent of these areas of relatively poorer ecological/habitats function is not as widespread today. The most polluted area is the Consolidated Slip of the Port of Los Angeles; “semi-healthy” areas exist in the Cerritos Channel of the Inner Harbor and in confined basins and slips in both ports (MEC 2002).

Water quality conditions measured during July 2008 generally were uniform throughout the environments of the ports, with only minor differences that appeared to be unrelated to natural community (SAIC 2010). Further, water quality conditions also were consistent with values reported previously for the ports (MEC 2002), and indicative of well-mixed and well-oxygenated waters (e.g., DO greater than 5 mg/L) for almost all stations (SAIC 2010). Some localized differences, associated with comparatively warmer surface water temperatures, lower surface water salinities, and lower DO concentrations in near-bottom water, were observed, but the magnitude of the differences were considered small (SAIC 2010).

The waters of ports of Los Angeles and Long Beach (including Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach), San Pedro Bay, Dominguez Channel, Dominguez Channel estuary, Torrance Lateral Channel (sometimes referred to as Torrance Carson Channel), and Los Angeles River Estuary are impaired by heavy metals and organic pollutants (CRWQCB 2011). More specifically, each of these water bodies are included on the 303(d) list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, and certain PAH compounds (CRWQCB 2011). These impairments may exist in one or more environmental media — water, sediments, or tissue (CRWQCB 2011).

Some site specific data are available that suggest varying levels of contamination in the sediments to be dredged. Additional testing will be required to determine what materials from which areas may be re-used for habitat creation or beach replenishment, disposed of at an ocean dumping site, or disposed of at a confined disposal facility or appropriate upland site. The Service will provide additional input on these determinations as information regarding physical and chemical characteristics of the materials to be dredged becomes available.

San Pedro Bay Landfill Mitigation History

The agency consensus mitigation goal for San Pedro Bay (ports of Los Angeles and Long Beach) landfill impacts to date has been no net loss of habitat value for in-kind resources, as near to the site of loss as feasible, and in advance of, but not later than concurrently with, the fill (Corps and LAHD 1992). For the last several years, the Service, Department, the National Marine Fisheries Service, the City of Los Angeles Harbor Department, and the Port have been designing and executing mitigation plans for development projects in the ports. The process employs a modified habitat evaluation procedure and involves evaluation of the habitat value in the affected port area and compares that to predicted habitat value increases at conceptual mitigation areas.

Following implementation of measures for avoiding and minimizing impacts to fish and wildlife resources, on-site mitigation has been conducted in the adjacent Port of Los Angeles consisting of creation of shallow water from deep areas. In 1985, as a condition of the Harbor Deepening Project in the Port of Los Angeles, the Corps created 190 acres of shallow water (i.e., water less than -20 feet MLLW) as mitigation for the filling of 190 acres of shallow water to make the land area now called Pier 300. The created shallow water area, now called the Pier 300 Shallow Water Habitat, has been the subject of several biological investigations (MEC 1988, 1999) and shown to provide highly productive habitats for fish. It is also an important foraging area for the California least tern (KBC and Aspen Environmental Group 2004).

Potential Impacts of the Proposed Project on Biological Resources

The proposed project would involve deepening of portions of the Port to currently undetermined depths with the disposal of dredge material at currently undetermined locations. The project would involve dredging of only relatively deep (i.e., greater than 20 feet) water areas of San Pedro Bay. These deeper water impacts typically do not involve what is considered significant long-term loss of habitats warranting mitigation.[18] Anticipated potential effects associated with dredging and disposal of dredge materials would depend largely on disposal location; these potentially include: 1) the permanent elimination of fish and wildlife habitats associated with any in-bay landfills; 2) a temporary reduction in available foraging habitat for piscivorous bird species, including the least tern, due to dredging or disposal-associated turbidity generated by the project (depending on locations); 3) the reduction of deep water habitats and creation of shallow water fish habitats with any in-bay subaquatic fill of deeper waters; 4) the reduction of deepwater habitats and creation of island (nesting bird) habitats with any in-bay island fill of deeper waters; and 5) temporary impacts of burying of beach- and nearshore-associated invertebrates and nearshore turbidity associated with disposal of dredge materials through local beach/nearshore replenishment.

The dredging of deeper water areas within the project footprint would impact the invertebrate benthic fauna and demersal fish communities found in these areas. These dredging impacts would be largely temporary, although the resultant areas would then be deeper in the long-term. The replacement benthic fauna that would colonize these dredged areas in the years following project

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[18] Historically, mitigation has been required for dredging that deepens shallow water areas, 20 feet deep or less, because the deepening reduces or eliminates the fish nursery and bird foraging values. No such impacts to areas less than 20 feet deep are anticipated with this project.

implementation would likely be different; this fauna would include species combinations adapted to these new deeper areas. The vast majority (if not all) of these areas have been subject to dredging in the past century, with varying levels of recovery since the last dredging event. It is undetermined what areas of the project footprint would be subject to future maintenance dredging.

The dredging and disposal of dredge materials creates temporary turbidity impacts to surrounding waters. When dredge materials are used to create shallow water or island habitats this typically creates long-term benefits due to the typically higher functions and values for fish and wildlife attributable to shallow water and sensitive species nesting areas. The size and duration of the turbidity plume generated by dredging and disposal activities is dependent on grain size of the suspended material and current velocities at the time the activity is conducted (Corps and LAHD 2000). Project dredge material qualities, disposal locations, and associated current velocities are unknown; therefore, turbidity is not readily predictable for the project. The amount of turbidity is generally greater in the immediate vicinity of the filling/disposal operations than at the dredge site because the dredge typically operates with suction, while the filling operation is often by discharge from a pipe (Corps and LAHD 2000). However, based on past dredge disposal operations, the extent of the turbidity plume is not expected to be greater than several hundred feet from the discharge point. Because several hundred acres of high-function shallow water foraging habitat are available for piscivorous bird species within the Port region (e.g., 193-acre Pier 300 Shallow Water Habitat and 326-acre Cabrillo Shallow Water Habitat), the area of disturbance from the project would likely represent a small portion of available foraging habitats for such birds.

Recommendations

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Consistent with Fish and Wildlife Coordination Act, should the project be implemented, we suggest incorporation of the following planning aid recommendations in order avoid, minimize, and compensate potential impacts to fish and wildlife resources, and suggest the Corps incorporate the project design elements outlined below that would improve fish and wildlife resources:

1. The Corps should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, the Corps should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters.[19] The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

[19] We suggest these locations so as to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by these measures.

A portion of the island should have a zone of low gradient shoreline slope down to the water within a protected cove(s), likely adjacent to and facing the existing breakwater within the Port for swell protection. Other features such as subaquatic reefs constructed of rock are also suggested, in part to help prevent erosion of the island cove shoreline surface materials from swells. The configuration and slope surface of the noted cove should be constructed of sand and gravel or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack[20] and would otherwise support snowy plover chick and adult foraging. The remainder of the island (outside of the cove portion) would likely need to be edged by riprap to avoid erosion of the island by swells. Possibly waste rock from other proposed projects in the area (e.g., partial or full removal of the Long Beach Breakwater) could be used/combined for this purpose. It is preferred that the surface of this island not be utilized for human recreation and be protected from unauthorized entry.

3. The Corps should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. The Corps should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by the Corps, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

   a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, the Corps should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

   b. Visually monitor and report to the dredging contractor or Corps contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the Corps biologist be notified immediately. An appropriate buffer zone around the nest for

[20] Beach wrack consists of organic material such as kelp and sea grass that is cast up onto the beach by surf, tides, and wind. Beach wrack supports a wide variety and large quantity of beach invertebrates.

exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

If you have any questions you have regarding this letter, please contact Jon Avery, Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

CAROL ROBERTS
Digitally signed by CAROL ROBERTS
Date: 2016.06.30 15:09:09 -07'00'

Scott A. Sobiech
Deputy Field Supervisor

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COORDINATION ACT REPORT

U.S. FISH AND WILDLIFE SERVICE
14 APRIL 2021

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-LA-15B0128-21CPA0060

April 14, 2021
Sent Electronically

Colonel Julie A. Balten
U.S. Army Corps of Engineers – Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Larry Smith

Subject: Final Coordination Act Report for the Proposed Long Beach Project, Los Angeles County, California

Dear Colonel Balten:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Coordination Act Report (Final CAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe ecological components and processes, identify opportunities to protect and improve biological resources, and provide recommendations related to the conservation and enhancement of fish and wildlife species in the project area. The Corps' Los Angeles District and the Port of Long Beach (POLB), have completed a Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Port of Long Beach Deep Draft Navigation Feasibility Study (feasibility study) located in the City of Long Beach, Los Angeles County, California. The feasibility study was published in October 2019 and provided to fulfill both federal National Environmental Policy Act (NEPA) and state California Environmental Quality Act (CEQA) environmental documentation requirements as the combined EIS/EIR (Corps 2019a).

The purpose of the proposed project is to evaluate and improve existing navigation channels within the Port of Long Beach to improve conditions for current and future container and liquid bulk vessel operations and safety (Corps 2019c). The proposed project would be located mainly at the Port of Long Beach Federal channels and berths serving Pier J and Pier T/West Basin (see Figures 1 and 2). The proposed project would deepen existing channels and construct a new Federal channel and turning basin by dredging and disposing of sediment. The total proposed dredge area is approximately 880 acres, and the project would expand the size of existing navigation channels and turning basin areas by approximately 345 acres (NOAA 2019). As proposed, dredged sediments would be placed in a nearshore disposal site off the coast of the City of Seal Beach, in Orange County, California (see the "Nearshore" site in Figure 3) and at two Environmental Protection Agency-designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties. The disturbance area of new dredging (areas that have not been dredged previously) from the proposed project would be approximately 241 acres (NOAA 2019).

The overall project region (the general area including and surrounding all proposed project activities) consists of nearshore and offshore areas of a portion of San Pedro Bay in Los Angeles and Orange counties within 10 miles of the coast. The main project area (the area of all proposed project activities, excluding locations for dredge materials placement and associated transit zones between dredging and dredge materials placement) encompasses portions of the Los Angeles County coast of the eastern Pacific Ocean, predominantly within about 5 miles seaward of the historical coastline near the mouth of the Los Angeles River and the coast of the City of Long Beach in San Pedro Bay. The shoreline, marine, and former estuarine areas of the main project region (Figure 1) and main project area (Figure 2) have been heavily modified over the last century, associated with port development, oil extraction, and coastal commercial/urban development. Before the 20th century, the areas that are now the ports of Los Angeles and Long Beach were predominantly estuaries of the Los Angeles and San Gabriel rivers (Port of Long Beach 2011). The formerly extensive natural mudflats and marshlands of the main project area historically provided expansive habitats for birds, fish, and invertebrates, and the former barrier beaches, river mouths, and sand spits of the area served as nesting and foraging habitats for a variety of seabirds and shorebirds (Arnold 1903; POLB 2011). Very small remnants of these natural communities/habitats remain intact in the main project area.

This Final CAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq*.), and the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq*.). The Final CAR is a report per section 2(b) of the FWCA; it does not constitute a biological opinion under section 7 of the ESA. The purpose of this Final CAR is to deliver information and recommendations for use by the Corps' design-planning team in developing goals, objectives, and alternatives/modifications to the project.

INTRODUCTION

Nearshore[1] ecosystems include many biological resources that are of high ecological, recreational, subsistence, and economic value. California's nearshore ecosystems are some of the most productive ocean areas in the world (CDFG 2001). These systems are home to a wide variety of fishes, kelp, marine invertebrates, and marine mammals, as well as a large number of sea and shorebird species (CDFG 2001). These systems also are subject to influences from natural and human-caused perturbations, which can originate in terrestrial or oceanic environments. Nearshore marine habitats are productive, while also vulnerable, owing to their connections to pelagic and terrestrial landscapes. About 450 species of fish occupy California's nearshore ecosystem within the limits of the continental shelf (CDFG 2001).

[1] The nearshore is defined as the area from the coastal high tide line offshore to a water depth of 120 feet.

Figure 1. Main Project Region (Corps 2019a).

Figure 2. Main Project Area (Corps 2019a).[2]

[2] The white solid line boundary shown in the Corps' figure above denotes the "Existing Federal Project" main channel and approach channel for the Port of Long Beach – which are both currently dredged to 76 feet below mean lower low water. The "C" represents the proposed project "General Navigation Features" that would be constructed for container ships. The "LB" represents the proposed project "General Navigation Features" that would be constructed for liquid bulk vessels. The hashed and solid light blue areas represent proposed project dredging. The dotted line denotes the Port of Long Beach boundary.

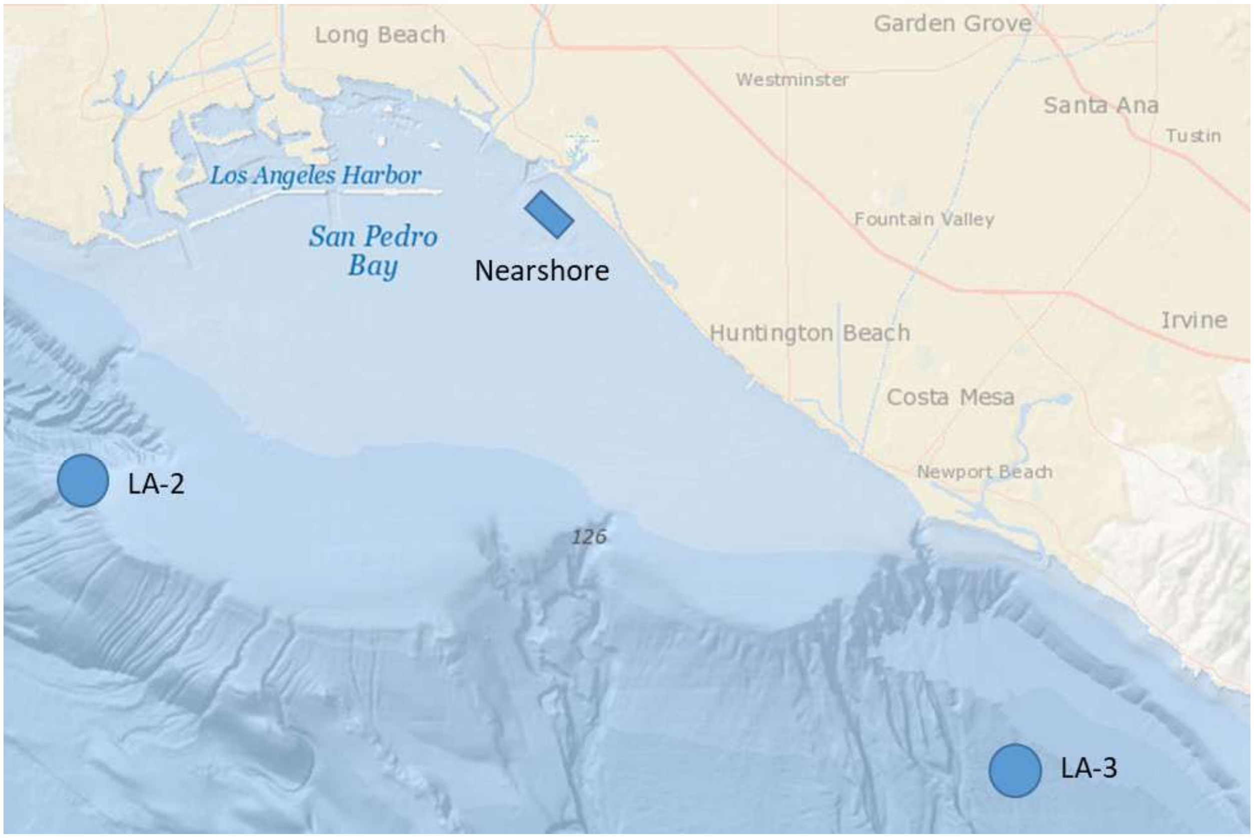

Figure 3. Full Project Region and Dredge Material Placement Portion of Project Area (Corps 2019a).

San Pedro Bay is a large inlet of the eastern Pacific Ocean along the southwestern continental United States coast, within the Southern California Bight. The Southern California Bight encompasses the marine waters from Point Conception at the northwest end of the Santa Barbara Channel, to a point just south of the border between the United States and Mexico. The Southern California Bight is notable for complex bathymetry, offshore islands, and for being adjacent to a highly developed coastal region with substantial anthropogenic inputs into the coastal ocean (Todd *et al*. 2009). More than 22 million people live along southern California's coast (Brothers 2015).

The San Pedro Bay region includes the Port of Los Angeles and the Port of Long Beach, which together form the fifth-busiest port facility in the world and the busiest port in the Americas. San Pedro Bay is bounded by the City of Los Angeles communities of San Pedro on the west, Wilmington on the north, and by the cities of Long Beach and Seal Beach on the north and east.

Coastal development of Long Beach and a century of harbor dredging and filling associated with development of the ports of Los Angeles and Long Beach eliminated thousands of acres of Los Angeles River estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 (the predecessor to the FWCA of 1958 noted above) included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The Fish and Wildlife Coordination Act of 1934 was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act (NEPA) of 1969 (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be "supplementary legislation" to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. Notably, the FWCA authorizes the Federal project implementation of these noted means and measures for both mitigating losses of fish and wildlife resources and for enhancing these resources beyond the scope of offsetting of project effects (Smalley and Mueller 2004).

PROJECT REGION HISTORY

The project region history was substantially covered in our Planning Aid Report on the subject project dated June 2016. This document is enclosed and incorporated herein by reference.

PROPOSED PROJECT

Recommended Plan – "Alternative 3"

The proposed project is termed Alternative 3 within the feasibility study. It was also the Corps' Tentatively Selected Plan (TSP) for the feasibility study, from the several project alternatives analyzed (Corps 2019a). Alternative 3 from the feasibility study is now officially the Corps' Recommended Plan (Corps 2021).

The Recommended Plan, which would be undertaken jointly by the Corps and the POLB, would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) in the POLB to a depth of -80 feet (ft) mean lower low water (MLLW), widen portions of the Main Channel (bend easing) to a depth of -76 ft MLLW, construct an approach channel and turning basin to Pier J South to a depth of -55 ft MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55 ft MLLW. The POLB would also deepen two additional locations within the harbor to a depth of -55 ft MLLW: the Pier J Slip, including berths J266-J270, and berth T140 on Pier T. Structural improvements would also be performed on the Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 ft MLLW; these activities are considered "Local Service Facilities" and would be undertaken solely by POLB.

The total proposed dredging volume is approximately 7.4 million cubic yards (mcy) of sediment, and total dredge area is approximately 880 acres (NOAA 2019). The project would expand the size of existing navigation channels and turning basin areas in the POLB area by approximately 345 acres (NOAA 2019). Proposed construction would begin in 2024 and is anticipated to take approximately 39 months to complete (Corps 2019c).

As proposed, only project sediments dredged from the deepening of the POLB Approach Channel would be placed in a nearshore disposal site off the coast of the City of Seal Beach (see the "Nearshore" site in Figure 3). This Nearshore site is also otherwise known as the Sunset/Surfside Borrow Site for other projects in the area (e.g., Corps 2019b), and is herein termed the "Nearshore/Sunset/Surfside site." Sediments dredged from the balance of project dredging areas would be placed at two designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties.

The Nearshore/Sunset/Surfside placement site, approximately 5 miles from the main project area at the POLB, can accommodate about 2.5 mcy of dredged material in total (NOAA 2019). The dredge material placement sites LA-2 and LA-3 are approximately 9 miles and 22 miles, respectively, from the main project area in the POLB. Sites LA-2 and LA-3 have an allowed annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources (NOAA 2019). It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 would be available for use by this project each year (NOAA 2019). Vessel transit routes between the dredging locations and disposal sites are not mapped or identified in the feasibility study but are assumed to involve routes predominantly in direct lines from proposed dredging areas to noted disposal areas.

Dredging would be performed using a hopper dredge as well as an electric clamshell dredge. Disposal of material from the hopper dredge would maximize use of the Nearshore/Sunset/Surfside site, while a clamshell dredge would be utilized for sediment disposal at the disposal sites LA-2 and LA-3. The Approach Channel portion of the project would be completed in about 5 months of project-year one, utilizing the Nearshore/Sunset/Surfside placement site and LA-2 (Corps 2019a). The rest of the project activities, to be completed by the clamshell dredge, would take the remainder of the project's estimated total of 39 months (Corps 2019c). The total proposed dredging volume is approximately 7.4 mcy and total dredge area is approximately 880 acres (NOAA 2019).

The feasibility study indicates that the POLB would implement structural improvements to the Pier J breakwaters to address the need for increased structural stability associated with the deepened adjacent channels resulting from the project. As proposed, the types of structural improvements could consist of a series of project options: placing additional rock at the base of the existing breakwater structures, placing rock on the dredge slope using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method to be utilized would be injection of concrete grout at the base of the existing breakwater structures.[3] However, the feasibility study does not specify the location, amount, and/or type of fill associated with these improvements.

Project Dredge Equipment

The proposed project would utilize the following two types of dredges:

1. Hopper Dredge: A hopper dredge is a self-contained vessel that loads sediment from dredge sites then moves to a receiver site for placement. Approximately 17,500 cubic yards of sediment can be removed and transported to the placement site per day using a hopper dredge; although this can vary depending on the transit trip length to the placement/disposal site. The hopper dredge contains two large arms that drag along the ocean floor and collect sediment. The hopper dredge moves along the ocean surface with its arms extended, passing back and forth in the designated dredge site until the hull is fully loaded with sediment. The hopper dredge can generally reach within approximately 0.5 mile of shore to offload to a nearshore site. A single hopper dredge would be used for the project, and it would place all of its dredged material at the Nearshore/Sunset/Surfside placement site; this would involve a total of about 2.5 mcy of sediment to be removed and placed using this equipment.

2. Clamshell Dredge: The clamshell dredge consists of a derrick mounted on a barge outfitted with a clamshell bucket. Dredged materials are placed on a separate barge for transport to the placement site. Approximately 6,000 cubic yards of sediment can be removed and transported to the placement site per day using a clamshell dredge. Additional construction equipment typically required to support dredging activities

[3] The proposed ground improvement option would consist of injecting cement grout at high pressures into the soils behind a proposed sheet pile wall. The intent of the grout is to strengthen the soil behind the wall, relieving pressure on the bulk head. The injection of the grout as proposed would be accomplished by land-based equipment working on the adjacent wharf (Corps 2019a).

using a clamshell dredge include three support boats (two tugboats to move the barge and/or reposition the dredge, and a crew boat). Clamshell dredges are generally diesel-powered; however, all-electric clamshell dredges are available. An electric clamshell would be used for the proposed project as mitigation for air quality impacts. A single clamshell dredge would be used for the project, and a total of about 4.9 mcy of sediments would be removed and transported to the offshore disposal sites LA-2 and/or LA-3 using this equipment (Corps 2019a).

DESCRIPTION OF THE PROJECT REGION, PROJECT FOOTPRINT, AND PROJECT AREA

The project region, project footprint, and project area were substantially analyzed in our Planning Aid Report on the subject project in June 2016 (Enclosure).

DESCRIPTION OF BIOLOGICAL RESOURCES

The fish and wildlife resources of the POLB are reported in detail in a 2016 report entitled: *2013-2014 Biological Surveys of Long Beach and Los Angeles Harbors* (MBC 2016). The biological resources of most of the project region were analyzed within the 2019 feasibility study for the project noted above. Additionally, the biological resources of the main project area were substantially covered in our Planning Aid Report on the subject project dated June 2016 (Enclosure). Please refer to these resources.

The northern portion of San Pedro Bay is dominated by the ports of Los Angeles and Long Beach. These ports are large harbor complexes typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge-maintained channels (SAIC 2010). The benthic hard substrates in the port areas are mostly artificial breakwaters and constructed walls and pilings in shallow water areas in the ports (LA/LBHSC 2016).

The physical habitats of the bottom of San Pedro Bay, with the exception of the artificial structures, is mostly natural soft bottom substrates (Allen 1985; Anchor Environmental 2001). Maximum water depths in the bay typically do not exceed 53 ft (Robbins 2006).

The main project area within POLB where dredging is proposed consists primarily of deep water soft bottom habitats. Specific to zones adjacent to the main project footprint, MBC Applied Environmental Sciences (MBC) observed kelp on both faces of the Long Beach and Middle breakwaters; both faces of Pier F and the Navy Mole; the west-, south-, and east-facing outer faces of Pier J; and both faces of the breakwaters protecting the Pier J slip (MBC 2016).

Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus californianus*) are commonly observed within the port complex and surrounding areas. Cetaceans known to occur within the POLB complex area include bottlenose dolphin (*Tursiops* spp.) and common dolphin (*Delphinus* spp.). Both pinnipeds and cetaceans utilize the waters of the project region primarily to rest and forage (MBC 2016).

Sea Turtles

Pacific green sea turtles (*Chelonia mydas*; green sea turtles) have been reported from the project region about 2 miles northwest of the proposed Nearshore/Sunset/Surfside placement site since at least 2008, most frequently from the mouth of the San Gabriel River. They are the only sea turtle species likely to occur in the project region. The San Gabriel River and its associated wetland/estuarine areas comprise the northernmost known year-round habitats for the green sea turtle (Aquarium of the Pacific 2019). The green sea turtles using this area and environs are federally-listed as threatened. Green sea turtles are generally found inside reefs, bays, and inlets (except when migrating or transiting). They are attracted to lagoons and shoals with an abundance of marine grass and algae. Nesting of green sea turtles is not considered likely in the project region with the high level of human disturbance on almost all beaches. The green sea turtles observed in the project region over the last decade are reportedly predominantly of the teenage age class, with no reports of small juveniles in the area (Goldman 2016); although, a few reports of breeding-age green sea turtles have come from the San Gabriel River (Propes 2017).

The small and growing population of green sea turtles in the project region mainly persists in and around the San Gabriel River mouth (likely associated with the warm water outfall of the Haynes Generating Station) and within Anaheim Bay/Seal Beach National Wildlife Refuge (SBNWR) estuarine complex (about 1 mile north of the Nearshore/Sunset/Surfside site) (CaliforniaHerps 2018; Crear *et al*. 2016). The available information suggests that while green turtles are present in the estuarine reach of the San Gabriel River year round, their presence may be more seasonal (summer and fall) in other locations in the region when water temperatures are warmer including: Anaheim Bay and other waters in the SBNWR, Sunset/Huntington Harbor, and Alamitos Bay. Crear *et al*. (2016) showed that tagged juvenile sea turtles left SBNWR/Anaheim Bay and moved through the ocean off Seal Beach into the San Gabriel River during winter months, when ocean water temperatures dropped below 59°F/15°C. Conversely, sea turtles moved through Anaheim Bay to get to the 7th Street Basin in the SBNWR during summer and fall months. In the project region, the bay and estuarine habitat areas in which green sea turtles appear to most frequently occur are primarily adjacent and inshore of the project area (NOAA 2020). The expansion or re-expansion of the green sea turtle range and population numbers in southern California in recent years has presented additional conservation challenges for the species, including exposure to marine pollution (Barraza *et al*. 2020), vessel strikes, and potential interactions with marine development (Hanna *et al*. 2020).

Radio tracking data from green sea turtles in the project region indicate that most tagged turtles of the region spent their time in the mouth of the San Gabriel River, with a few turtles swimming into the ocean during the day and returning to the San Gabriel River mouth at night (Goldman 2016), likely crossing portions of the project footprint. The Navy, in collaboration with the National Marine Fisheries Service (NMFS), has been implementing a green sea turtle satellite tagging study to help monitor green sea turtles within the Anaheim Bay region. Preliminary results from this effort indicate that habitat utilization is highest within the SBNWR, but a number of forays have occurred in the adjacent nearshore area of the ocean (Bredvik *et al*. 2019). Of 16 green sea turtles satellite-tagged, two of the turtles went into the ocean after visiting Anaheim Bay (Hanna *et al*. 2020). One individual travelled west from Anaheim Bay along the coast, as far as Rancho Palos Verdes, while another travelled south-east to Dana Point (see Figures 4 and 5; Hanna *et al*. 2020). Both sea turtles then travelled back into Anaheim Bay (Hanna *et al*. 2020). Overall tagging study results indicate use of nearshore habitat in East San Pedro Bay including limited movements in the project footprint, within and adjacent to the Nearshore Surfside/Sunset disposal site (NOAA 2020, 2021) and likely transit zones. We conclude that green sea turtles have considerable potential to occur in the project footprint during the 39 months of proposed project activities.

Figure 4. Locations of an individual satellite-tagged green sea turtle (#PTT 152310) in San Pedro Bay and environs during the period of November 2018 to February 2019, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

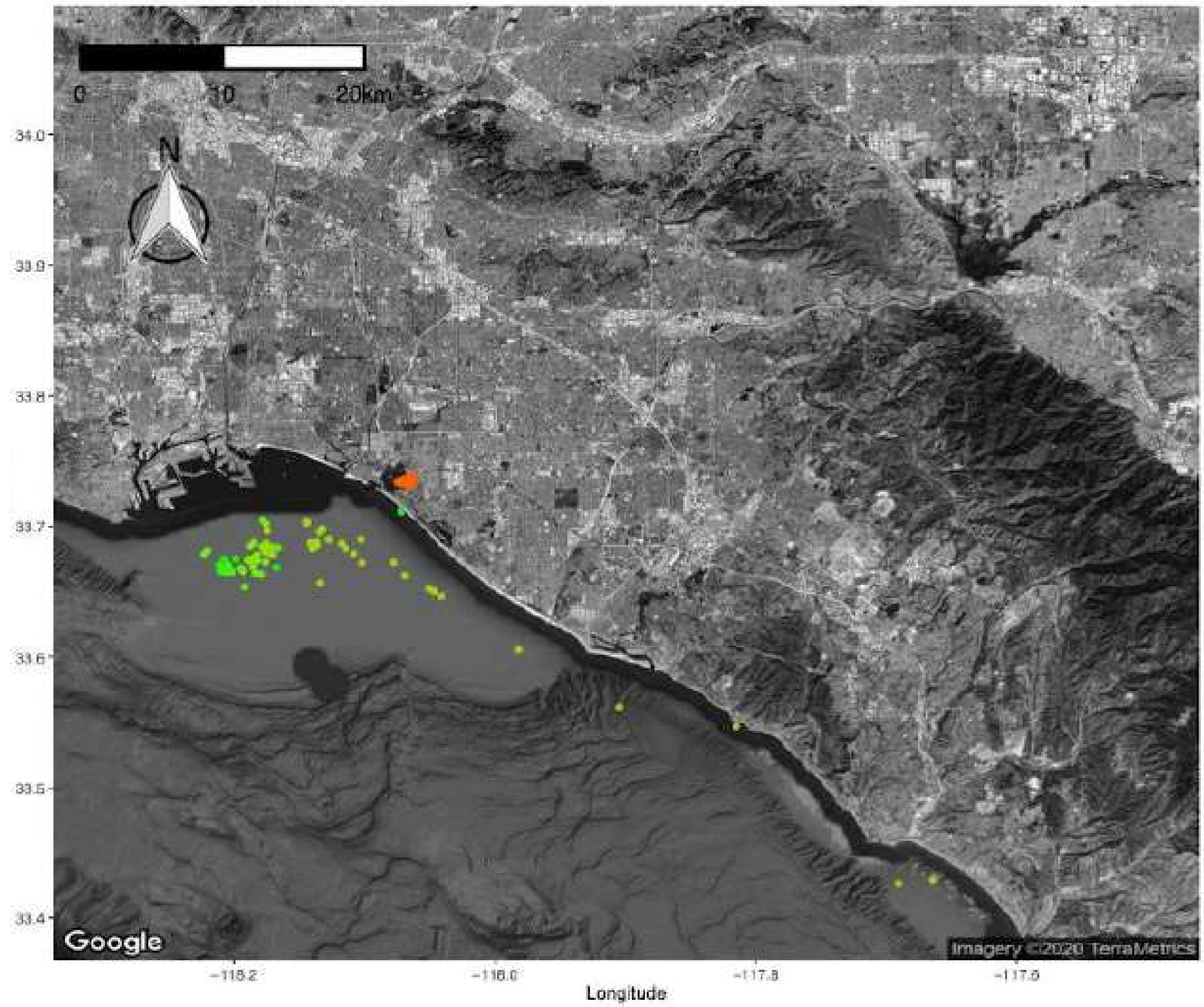

Figure 5. Locations of an individual satellite-tagged green sea turtle (#PTT 182986) in San Pedro Bay and environs during the period of July 2019 to March 2020, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

Potential Impacts of the Proposed Project on Biological Resources

Many of the potential impacts within the main project area were substantially analyzed in our Planning Aid Report (Enclosure). Please refer to that document.

The proposed project activities would occur predominantly within soft bottom areas within San Pedro Bay. Marine soft-bottom habitats are naturally common within the project area, including proposed dredge placement/disposal areas. The project would likely result in short term increases in turbidity and noise compared to existing levels in the immediate areas around proposed project activities.

The direct footprint of the proposed project activities would occur in areas that are predominantly unvegetated bottom habitats, likely of existing low to moderate biological productivity, depending on the history of past dredging activities at each location and ongoing ship-related propeller turbulence. Adverse impacts to adjacent soft bottom habitats from indirect effects (e.g., turbidity) from project activities would likely be short-term.

According to the feasibility study, some areas within the proposed Pier J approach channel project footprint have not previously been dredged (Corps 2019a; NOAA 2019). This area was naturally deep enough in the past to accommodate container vessels going to Pier J in the POLB without dredging. Proposed dredging of these sediments are expected to result in sediments suitable for open ocean disposal, due to their high sand content. Based upon updated information provided by the Corps subsequent to the feasibility study, the proposed dredging would include 241 acres of new dredging (NOAA 2019); these areas are likely ecologically intact soft-bottom areas of moderate function that are currently partially disturbed by ongoing vessel activities, as noted above.

The feasibility study indicated that the proposed activities related to deepening of project channels would affect some fish species/habitats in the following ways: (1) temporary disturbance and displacement of fish species, (2) increased sediment loads and turbidity in the water column, (3) temporary loss of food items to fisheries (vis-a-vis temporary loss of soft bottom habitats and associated benthic invertebrates), (4) limited sediment transport and re-deposition, and (5) temporary degradation of the water quality due to dredging and construction activities.

The Pacific Fishery Management Council (1998, 2019) has identified broad types of potential adverse effects and recommendations to consider when evaluating coastal marine dredging and disposal projects. In general, the potential adverse effects on fish from dredging and disposal include: (1) loss and alteration of habitat; (2) altered hydrology and geomorphology; (3) sedimentation, siltation, and turbidity; (4) release of contaminants; (5) direct impact to organisms; and (6) noise. Of particular concern are benthic impacts associated with dredging of new areas and potential fill impacts associated with proposed structural work, noted above for Pier J breakwaters (NOAA 2019).

Many fish species of the project area forage on infaunal and bottom-dwelling organisms, such as polychaete worms, crustaceans, and other prey types. Proposed dredging may adversely affect these prey species at the site by directly removing or burying these organisms (Pacific States Marine Fisheries Commission 2005). Recolonization studies suggest that ecological recovery[4] may not be straightforward, and the process can be regulated by physical factors including ocean-bottom matrix particle size distribution, currents, and compaction/stabilization processes following disturbance (Dernie *et al*. 2003; Kaiser *et al*. 2006). Rates of recovery for these areas range from several months to several years for estuarine muds and up to 2 to 3 years for sands

[4] In this context, recovery here generally means the later (or mature) phase of benthic community development following disturbance. Early phases of benthic community development following disturbance often predominantly involve pioneering species different from the original species. Later phases of community development involve initial re-establishment of species that inhabited the area prior to disturbance. The latter phase is what is considered the initial recovery of the community that naturally existed on the site (Rosenberg *et al*. 2002; Dernie *et al*. 2003).

and gravels (Dernie *et al*. 2003; NOAA 2019). Recolonization can take up to 1 to 3 years in areas of strong current, and up to 5 to 10 years in areas of low current (Kenny and Rees 1996; Boyd *et al*. 2005; Pacific States Marine Fisheries Commission 2005; Kaiser *et al*. 2006). Given the large dredging footprint (i.e., 880 acres) and expansion into previously undredged areas (i.e., 241 acres), the adverse effects to benthic foraging habitats (e.g., for some fish species and their predators) from project dredging are likely more than temporary and minimal (NOAA 2019) as concluded by the feasibility study (Corps 2019a).

As a result of southern California's large human population and intense economic and recreational activity, very little coastal space exists that has not been subject to construction, mineral extraction, or other form of habitat alteration. Dredge and fill activities, shoreline armoring, and overwater structures are the primary causes of habitat alteration within southern California coastal marine ecosystems. At the ports of Long Beach and Los Angeles, increasing global economic trade have resulted in the need for larger, deeper draft ships to transport cargo. This has led to a demand for new construction and dredging to widen and deepen channels, turning basins, and slips to accommodate these larger vessels. The Corps' East San Pedro Bay Ecological Restoration Project feasibility study (Corps 2019b) specifically identified habitat loss and declines in abundance and biodiversity of marine populations as the primary problems in the region, which includes the majority of the project area.

The proposed disposal of dredged material offshore may adversely affect some fish habitats by: (1) impacting or destroying benthic communities, (2) affecting adjacent habitats, (3) creating turbidity plumes, and (4) introducing contaminants and/or nutrients (NOAA 2019). Sediment disposal at the ocean disposal sites LA-2 and LA-3 has previously undergone significant environmental review during their designation as offshore disposal sites. In addition, dredged materials proposed for disposal at these areas are evaluated through the Southern California Dredged Material Management Team approval process. We expect that these environmental review processes will adequately address anticipated or potential adverse impacts to marine habitats at these two offshore disposal sites.

Another project concern is the potential project-related spread of the invasive alga *Caulerpa taxifolia*, which has been introduced to the California coastline (NOAA 2019). It is one of two algae on the list of the 100 worst invasive species compiled by the International Union for Conservation of Nature Invasive Species Specialist Group (Lowe *et al*. 2000). Evidence of the harm that can ensue as a result of an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it has largely destroyed local ecosystems and adversely affected commercial fishing, coastal navigation, and recreational opportunities (NOAA 2019). Although it is not known to be present within the project area, it had been detected in two locations in southern California; one location in Agua Hedionda Lagoon in San Diego County and another (about 7 miles south of the Port of Long Beach) in Huntington Harbour in Orange County (NOAA 2019). If the invasive alga is present within the project area, the proposed dredging-disposal activities could adversely affect local marine ecosystems by promoting its spread and increasing its negative ecosystem impacts. The feasibility study indicates that pre-construction surveys for *Caulerpa taxifolia* would be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Nearshore/Sunset/Surfside disposal site. In addition, project construction would not begin if *Caulerpa taxifolia* is found within the project activity footprint, until cleared to do so by the NMFS (NOAA 2019). The noted proposed environmental commitments, including to survey appropriate locations for *Caulerpa taxifolia*, adequately addresses our concerns.

The feasibility study does not fully describe or analyze the proposed structural improvements to the Pier J breakwater. It does indicate that the placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters, if implemented, would have localized effects on marine biota, including to marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics at the site. Likewise, other motile organisms are expected to leave the main project area during such construction activities (NOAA 2019). Proposed rock placement as part of this activity would bury extant soft bottom habitats, likely replacing them over time with rocky reef type of habitats, after eventual colonization by reef species within and on the placed stone.

Riprap supports a unique biological community associated with the rock substrate in the POLB complex (MBC 2016). In addition, it supports canopy kelp habitats (NOAA 2019). If kelp is currently present in the footprint of areas proposed for the noted structural improvements, the use of concrete grouting in such locations would likely adversely affect canopy kelp habitats via direct disturbances to the macroalgal and associated communities and may ultimately reduce habitat complexity in these areas. This riprap and canopy kelp are currently important as settlement substrate, foraging, and refuge, for various living marine resources (NOAA 2019). Given the information provided regarding the type, location, and effects of the proposed Pier J structural improvements in the feasibility study is rather general, additional information would be necessary to fully assess the effects of these proposed structural improvements and identify appropriate specific conservation recommendations. However, we offer a preliminary conservation recommendation addressing these structural improvements below.

The feasibility study and subsequent correspondence from the Corps indicate that sea turtles do not occur in the study area for the project, and thus they would not be affected by the project.[5,6] Various sightings and strandings of green sea turtles have been documented in the POLB surrounding the main project area, and preliminary green sea turtle tagging results also indicate they are present in the project area (Bredvik *et al*. 2019; NOAA 2019; NOAA 2021).[7] Green sea

[5] This issue may have been partially caused by the Corps' apparent analysis of a study area and project area that do not include project dredge disposal areas and the associated dredge-disposal transit zones.

[6] In a March 30, 2021, letter to the Service on the project, the Corps stated: "The USACE has evaluated information provided to us by the NMFS on green sea turtles in the area. We have also consulted with the POLB, which monitors for green sea turtles during its in-water construction projects. Green sea turtles have been documented in Alamitos and Anaheim Bays. However, no green sea turtles have been documented in the project area, including the Surfside Borrow Site Nearshore Placement Area… We are confident in our position that the project would not effect this species and are maintaining the no effect determination." We note the Corps' conclusion but continue to maintain that there is a high likelihood that green sea turtles are likely to occur in the project area, as described herein.

[7] In a 2014 letter to the Corps identifying the threatened or endangered species that may be found in the project area, NMFS indicated that green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB (main project area), through observations of free-swimming and stranded animals, as well as through directed scientific research (NOAA 2019). In contrast, the Corps subsequently determined that federally-listed marine turtles do not occur in the study area, but are occasionally sighted in warm-water areas of

turtles are also known to occur in and near the Nearshore/Sunset/Surfside site portion of the project footprint, and potentially occur within what are likely the associated transit zones between project dredge locations and the Nearshore/Sunset/Surfside site (NOAA 2021). Sea turtles appear to be at risk of being harmed by the proposed activities. In 2012, a dead green sea turtle was found in Encinitas, California, with injuries reportedly consistent with contact from a hydraulic hopper dredge, similar to the dredge proposed for use in the subject project (Harris 2014; NOAA 2019, 2021). Dredging and sand placement activities for the Regional Beach Sand Project-II (RSBP-II) in 2012 were occurring in the Encinitas area before and at the time the turtle was found (SANDAG 2013).[8] The Corps recently consulted with NMFS on green sea turtles for the proposed East San Pedro Bay Ecosystem Restoration project in a portion of the same project region, including the Nearshore Sunset/Seaside disposal site as a borrow site (NOAA 2020). Based on the above, we conclude that green sea turtles likely occur in the project area/footprint and have substantial potential to be adversely affected by boat, barge, and dredge use and transit associated with the project, including vessel strikes.

Recommendations

The FWCA states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation..." (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage. The FWCA provides for the opportunity for us to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA.

The proposed project (Recommended Plan) contains a number of standard operating procedures, conservation measures, and mitigation measures to reduce the effects of the project on biological resources. Except where noted in our recommendations below, we expect the noted project mitigation and conservation measures within the feasibility study are integral components of the proposed project action and expect that all proposed activities will be completed consistent with those measures. Consistent with FWCA, should the project be implemented, we suggest incorporation of the following recommendations in order to improve project planning and avoid, minimize, and compensate for potential impacts to fish and wildlife resources; as well, we suggest the incorporation of the project elements outlined below that would improve or enhance fish and wildlife resources beyond the enhancements that could be achieved by offsetting measures alone:

1. As part of the proposed project, the Corps should create a least tern/snowy plover nesting island in the project region with rock and dredged materials. We suggest a location in San

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estuaries and bays in the region (NOAA 2019). In 2021 NMFS indicated that the agency "…disagrees with the USACE's assertion that green sea turtles are not in the project area" (NOAA 2021)."

[8] RBSP-II beach sand replenishment occurred at the Moonlight Beach receiver site from October 20 to 25, 2012, and at the Batiquitos receiver site (3 miles to the north of Moonlight Beach) from October 28 to November 24, 2012. The noted dead sea turtle was found on Moonlight Beach in Encinitas on November 4, 2012.

Pedro Bay shoreward of the existing Middle or Long Beach breakwaters.[9] Some potential sandy island locations in this area were evaluated within the Corps' East San Pedro Bay Ecosystem Restoration project. Other functional locations away from shore likely exist in the project region. This island should be at least 9 acres in size and relatively flat with the main surface of the island constructed of typical least tern nesting soil matrix materials (e.g., light-colored sand). To accommodate snowy plovers and the haul-out of some pinniped marine mammals, a portion of the island should have a zone of low gradient shoreline sloped down to the water within a protected cove, likely adjacent to and facing the existing breakwater for swell/wave energy protection. Other features such as subaquatic reefs constructed of rock are also suggested around the island, to provide shallow rocky reef habitats and to additionally help prevent erosion of the island cove shoreline surface materials (sand and gravel) through dissipation of wave energy. The configuration and slope surface of the noted island cove shore should be constructed of surface sand and gravel (possibly partially cemented or grouted in place for erosion control) or other compatible materials for snowy plover chick foraging; the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack and would otherwise support (e.g., shore slope angle) snowy plover chick and adult foraging. The remainder of the island (outside of the sand/gravel shore portion) would likely need to be edged by riprap or similar materials to avoid erosion of the island by wave and wind energy; similar to the four artificial THUMS islands[10] currently found off Long Beach within the project region. Dredged materials could be used for this purpose, at least in part. It is preferred that the surface/shore of this island not be utilized for human recreation and be protected from unauthorized entry.[11]

2. Consistent with the general recommendations provided by Pacific Fisheries Management Council (2019), the Corps should, to the extent feasible, offset all likely adverse effects to important marine fish habitats from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structures and functions in East San Pedro Bay. The Corps should evaluate the feasibility of re-using the dredged material that would be provided by the project (as contaminant levels in the

[9] We suggest these locations to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by this measure.

[10] The THUMS Islands are a set of four artificial islands in San Pedro Bay built in 1965 to tap into the East Wilmington Oil Field. THUMS stands for a consortium named after the parent companies who bid for the island contract: Texaco, Humble (now Exxon), Union Oil, Mobil, and Shell. The outside rim of the islands are made of 640,000 tons of boulders from Catalina Island, and the islands are filled with 3.2 mcy of dredged material from the bay (Sidel 1994).

[11] In a letter to the Service dated March 30, 2021, the Corps (2021) indicated that "Generally, the USACE would not propose to develop such an island for species as part of the navigation project unless it is justified as mitigation or offsets for adverse effects. The USACE has determined that the proposed project would not affect either California least tern or western snowy plover. In addition, there is no feasible location for such an island." We note that the FWCA directs the Service to make appropriate recommendations to action agencies such as the Corps that include measures beyond mitigation or project offsets, and it provides associated authorizations to implement those measures. Past development of the ports of Los Angeles and Long Beach, as well as urban and commercial development of the surrounding coastal communities, has eliminated almost all least tern and snowy plover nesting habitats that formerly occurred in the region. This recommendation is directed at partially replacing those historical losses, consistent with the mandates of the FWCA. The East San Pedro Bay Ecosystem Restoration project evaluated potentially feasible locations for such islands in the project region.

dredge materials allow) to support various restoration measures (e.g., to create: areas of shallow water habitats at depths less than -20 feet MLLW, nearshore wetlands, a sandy island as noted above) that would require fill material, as described in the Corps' East San Pedro Bay Ecological Restoration Project feasibility study.

3. We recommend that the Corps re-consider the risks of potential injury and disturbance impacts to green sea turtles in its determination of whether this species may be adversely affected by proposed project activities (NOAA 2019; NOAA 2021). In particular, we recommend that the Corps consider the risks of injury associated with hopper dredge activities, including transit between dredging and the Nearshore/Sunset/Surfside location outside the entrance to Anaheim Bay. Hopper dredge encounters with sea turtles known to occur in the southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS (NOAA 2019). We recommend that the Corps engage in consultation pursuant to the ESA with NMFS Protected Resources Division in Long Beach, California. Appropriate project monitoring for sea turtles by qualified individuals should be incorporated into the project, including monitoring for avoidance of project vessel strikes, as well as improved understanding of sea turtle use of the project area/region and potential effects associated with temporarily increased turbidity, with guidance developed in consultation with NMFS.

4. The Corps should analyze in greater detail the potential ecological impacts associated with Pier J breakwater structural improvements. Compensatory mitigation should be developed and implemented as appropriate for any permanent loss of fish or reef habitats, such as from fill placement associated with proposed Pier J breakwater structural improvements.

If you have any questions regarding this letter, please contact Jon Avery,[12] Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

KRISTINE PETERSEN

Digitally signed by KRISTINE PETERSEN
Date: 2021.04.14 12:58:03 -07'00'

for Scott A. Sobiech
Field Supervisor

Enclosure

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ENCLOSURE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
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In Reply Refer To:
FWS-LA-15B0128-16CPA0091-E00880

June 30, 2016

Colonel Kirk Gibbs
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Lawrence Smith

Subject: Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California

Dear Colonel Gibbs:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe issues and opportunities related to the conservation and enhancement of fish and wildlife resources. The project, as proposed, would involve dredging and deepening portions of the Port of Long Beach (Port), Los Angeles County, California. The purpose of the proposed project is to improve transportation efficiency and safety at the Port for large ships.

The proposed project area would involve portions of the Los Angeles County coast of the eastern Pacific Ocean, within about 3 miles seaward of the historic coastline near the mouth of the Los Angeles River. These existing marine and estuarine areas have been heavily modified over the last century associated with development of Long Beach Harbor/Port of Long Beach and nearby civil engineering and commercial/urban development. Most of the direct project footprint would occur within the boundaries of the Port; exceptions include proposed modifications to portions of the Pier J ship approach area (Corps 2016) and potential (currently undetermined) dredge material disposal areas, both of which are outside the Port harbor district area. The project area is located south of the City of Long Beach and east of the community of San Pedro and the Port of Los Angeles. The depths, widths, and volumes of dredge and disposal material associated with the proposed project are currently undetermined.

This PAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq*.), the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq*.), and the scope of work agreed upon by the Corps and the Service. This PAR does not constitute the report of the Secretary of the Interior as required by section 2(b) of the FWCA, nor does it constitute a biological opinion under section 7 of the ESA.

The purpose of this PAR is to deliver recommendations for use by the Corps design team in developing goals, objectives, and alternatives for the project.

In October 2015, the Council on Environmental Quality released Memorandum M-16-01 for Executive Departments and Agencies entitled Incorporating Ecosystem Services into Federal Decision Making. The memorandum recognizes that nature provides vital contributions to human economic and social well-being that are often not traded in markets or fully considered in decisions. It directs Federal agencies to incorporate ecosystem services into Federal planning and decision making,[1] and to develop, institutionalize, and implement policies to promote consideration of ecosystem services in planning, investments, and regulatory contexts. Additionally, it calls for integration of assessments of ecosystem services into relevant programs and projects, in accordance with the agency's statutory authority.

In November 2015 the White House released a Presidential Memorandum entitled Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. This memorandum underscores the importance of effectively mitigating adverse impacts to land, water, wildlife, and other ecological resources (EPA 2016). It orders five federal agencies, including the Departments of the Interior and Defense, to streamline regulations for offsetting environmental harm and to promote mitigation efforts. The memorandum establishes a national policy "net benefit goal" for natural resource use from projects. The memo seeks to unify natural resource mitigation goals across agencies; at a minimum, the memorandum calls for "no net loss" of land, water, wildlife and other ecological resources from federal actions including permitting; this extends the no-net-loss national policy standard for wetlands established by the President in 1989. The memorandum also directs that compensatory mitigation is now national policy (White House 2015); the memorandum was designed to ensure consistency and transparency as agencies across the Federal government develop mitigation measures (Bean 2016). Concurrent with the release of the November 2015 Presidential Memorandum, the Department of the Interior issued formal policy and guidance to its bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under its jurisdiction, using the best available science (Bean 2016). When assessing appropriate mitigation options, the Service relies upon a long established general mitigation hierarchy – first seeking to avoid impacts, then minimizing them, and then compensating for unavoidable impacts that could impair resource functions or values (Bean 2016).

As of March 2016, the Corps is preparing the Port of Long Beach Deep Draft Navigation Project Feasibility Study. The Corps is currently scoping project alternatives and will likely prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the project. This feasibility study phase of the project would likely conclude with the distribution of the Draft EIS/EIR for public review, reportedly scheduled by the Corps for 2018 (Corps 2015).

Repeated dredging is often necessary to maintain operations of many marine harbors. The dredging proposed herein would be implemented to increase the design water depths within the Port for ship

[1] Broadly defined, ecosystem services are the benefits that flow from nature to people, e.g., nature's contributions to the production of food and timber; life-support processes, such as water purification and coastal protection; and life-fulfilling benefits, such as places to recreate.

navigation purposes for very large ships (as compared to regular maintenance dredging). Harbor dredging often has effects on the marine environment, and dredged material disposal may affect water quality, mobilize contaminants, and bury or alter habitats, bathymetry, and physical processes (NOAA 2014).

Introduction

Vessels of increasingly larger size and deeper drafts[2] have been entering U.S. ports over the last decade-plus (NOAA 2015). The proposed project would be another increment in a series of dredge-and-fill projects over the last several decades that have modernized and reshaped the Port. This project would deepen water depths for access and navigation of very large ships within the Port. The latest generation of large cargo ships being built is twice the size of those that entered the global fleet only 15 years ago; these ships are now calling at the Port (Port 2016). These larger ships are reportedly more cost effective for ocean carriers and decrease transportation diesel consumption (Port 2016). These massive vessels, some with capacity of 14,000 Twenty-foot Equivalent Units (TEUs),[3] can be up to 1,200 feet long (Port 2016). Long Beach is one of only a handful of ports in North America capable of accommodating these larger ships, per the following features (Port 2016):

1. Deep-water main channel;

2. Deep-water terminals;

3. Berths designed to handle vessels that can exceed 156,000 tons fully loaded; and

4. Cranes that can move containers stacked 180 feet high and 24 boxes wide.

A century of harbor dredging and filling associated with development of the Port of Los Angeles and the Port of Long Beach has eliminated thousands of acres of the historic Wilmington Lagoon/Los Angeles River Estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Pacific Rim trade is increasing, along with the size of the some of the associated ships entering U.S. ports. The Port is a major center of international commerce on the west coast of the United States. Development of a permanent industrial base within the Port was gradual and began with increased harbor improvements and transportation in the early 1900s. It is the second-busiest container port in the United States, after the adjacent Port of Los Angeles. The Corps, in conjunction with the Port, are now examining options to provide additional channel depths to allow very large ships (with greater drafts than those that can currently be effectively accommodated) into the Port.

[2] The draft of a ship's hull is the vertical distance between the waterline and the bottom of the hull or keel.
[3] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The FWCA was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted in 1934, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act of 1969 (NEPA) (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be “supplementary legislation” to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. The FWCA authorizes the project implementation of means and measures for both mitigating losses of fish and wildlife resources, and for enhancing these resources beyond the offsetting of project effects (Smalley and Mueller 2004).

Project Area History

In 1542, Juan Rodriquez Cabrillo “discovered” the "Bay of Smokes" that is now called San Pedro Bay, describing it from offshore aboard ship. The smoke he described above the bay may have originated from the several Native American villages that existed near the bay along the Los Angeles River at the time. Much of the south-facing San Pedro Bay along the coast was originally a shallow estuary and mudflat (see Figures 1 – 3).

The area currently occupied by the ports of Los Angeles and Long Beach formerly included several undeveloped islands, and likely included barrier beaches and beach/river-mouth sand spits. These islands and spits likely included unvegetated beach and open areas that historically supported what are now sensitive species, including California least terns [*Sternula antillarum browni* (*Sterna a. b.*);[4] least tern] and western snowy plovers [*Charadrius alexandrinus nivosus* (*C. alexandrinus n.*); snowy plover].[5] The area of the northern San Pedro Bay was originally largely a marsh, with the Los Angeles River and the Bay sharing a common opening into the ocean.

In 1899 construction of the San Pedro Bay breakwater began near the project area. In 1906, the Los Angeles Dock and Terminal Company started development of Long Beach Harbor by purchasing 800 acres of sloughs and salt marshes associated with the Los Angeles River mouth estuary — an area that later became the inner portion (Inner Harbor) of Long Beach Harbor. In 1907, construction began on the Craig Shipyard in the Inner Harbor; the Craig Shipyard Company was also awarded a contract to dredge a channel from the open ocean to the new Inner Harbor. In 1911, the State of California (State) granted the tidelands areas of what is now the Port of Long Beach to the City of Long Beach (City) for port operations.[6] These tidelands were granted to the City in trust for the people of the State. This tidelands trust not only restricts the use of the tidelands, but the tidelands and tidelands-related revenues of the Port must be used for purposes related to harbor commerce, navigation, marine recreation, and fisheries. The Port currently includes more than 7,600 acres of wharves, cargo terminals, roadways, rail yards, and shipping channels, and is one of the world's busiest seaports (see Figure 3).

An 8.5 mile-long breakwater made of three rock segments stretches across most of San Pedro Bay, with two openings to allow ships to enter the harbor areas of the Ports of Los Angeles and Long Beach behind it. The initial western section of the breakwater, called the San Pedro Breakwater, was constructed between 1899 and 1911 at San Pedro; the Middle Breakwater was completed from 1911 to 1936, and the Long Beach Breakwater was completed after World War II. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively (Long Beach 2009).

The Los Angeles River is a major river and flood management waterway for the Los Angeles watershed basin. In the 1930s, the Army Corps began channelizing the river for flood damage reduction and by 1954, the entire length of the river was channelized (Long Beach 2009).
The river is now maintained by the Corps and the Los Angeles County Department of Public Works (Long Beach 2009). The Los Angeles River continues to discharge into San Pedro Bay at the northeastern edge of the proposed Project Area.

Considerable changes have occurred in the two ports since the 1970s. Some of these changes included deepening of navigational channels and basins; construction of substantial landfills at Piers 300 and 400 in the Port of Los Angeles; construction of a transportation corridor out to Pier 400; expansion of Pier J in the Port of Long Beach; and construction the west basin of the Cabrillo Marina

[4] The California least tern was originally and remains federally- and California State-listed under the generic name of *Sterna antillarum browni*; this original name is now otherwise invalid. The American Ornithologists Union in 2006 changed the valid generic name of the least tern to *Sternula*, with the California least tern then becoming *Sternula a. b.*) (Service 2016).
[5] California least terns typically nest in colonies on relatively open beach areas that are free of vegetation and are near fish prey (Service 2006). Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting western snowy plovers (Service 2007).
[6] Tidelands in California are defined as those lands and water areas along the coast of the Pacific Ocean seaward of the ordinary high tide line to a distance of three miles.

complex. As part of mitigation for construction and channel deepening, shallow water habitats were created in formerly deepwater areas near Pier 300, near the San Pedro Breakwater, and on the east side of Pier 400. Thus, several areas that were previously aquatic natural communities are now developed land areas, some former deep water areas are now shallow, and water circulation patterns within the Ports have been substantially altered.

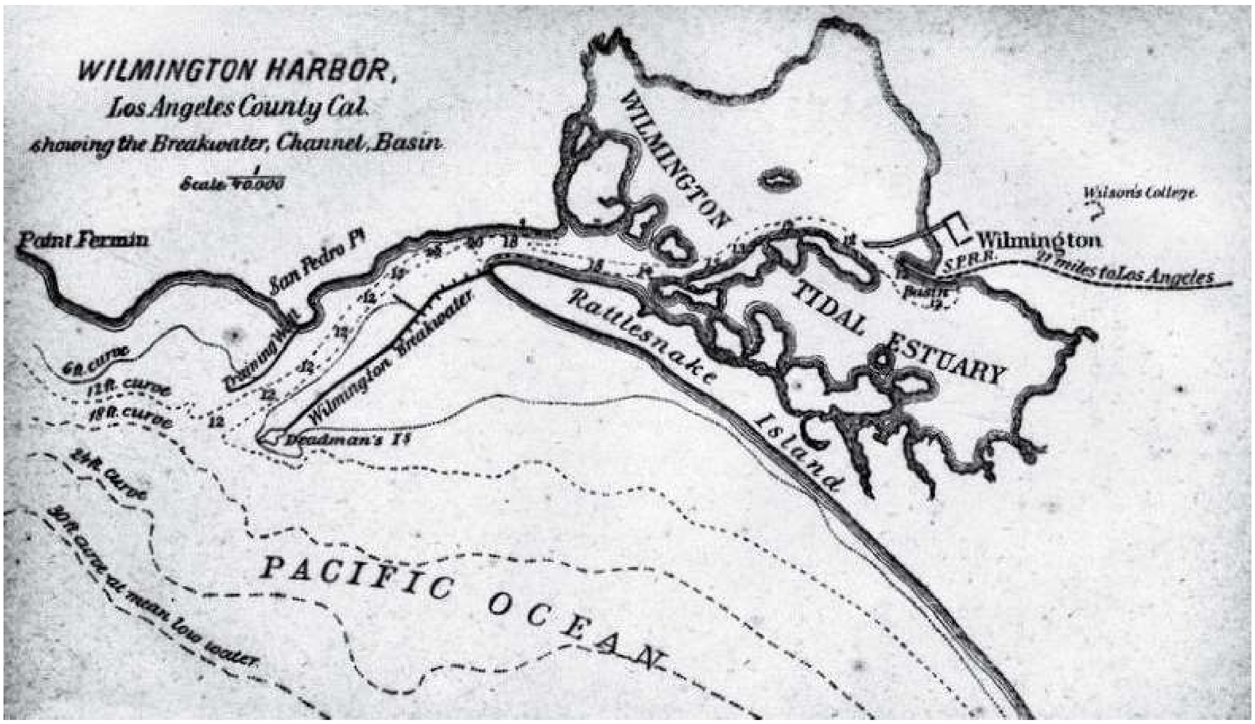

Figure 1. Circa 1880 drawing of Wilmington Harbor. The Future Port of Long Beach is on the east (right) side of the "Wilmington Tidal Estuary." "Rattlesnake Island" would later be expanded to become Terminal Island within the ports of Los Angeles and Long Beach. Wilmington Harbor would later become the Port of Los Angeles. Note the water depths indicated. (Water Power and Associates 2014)

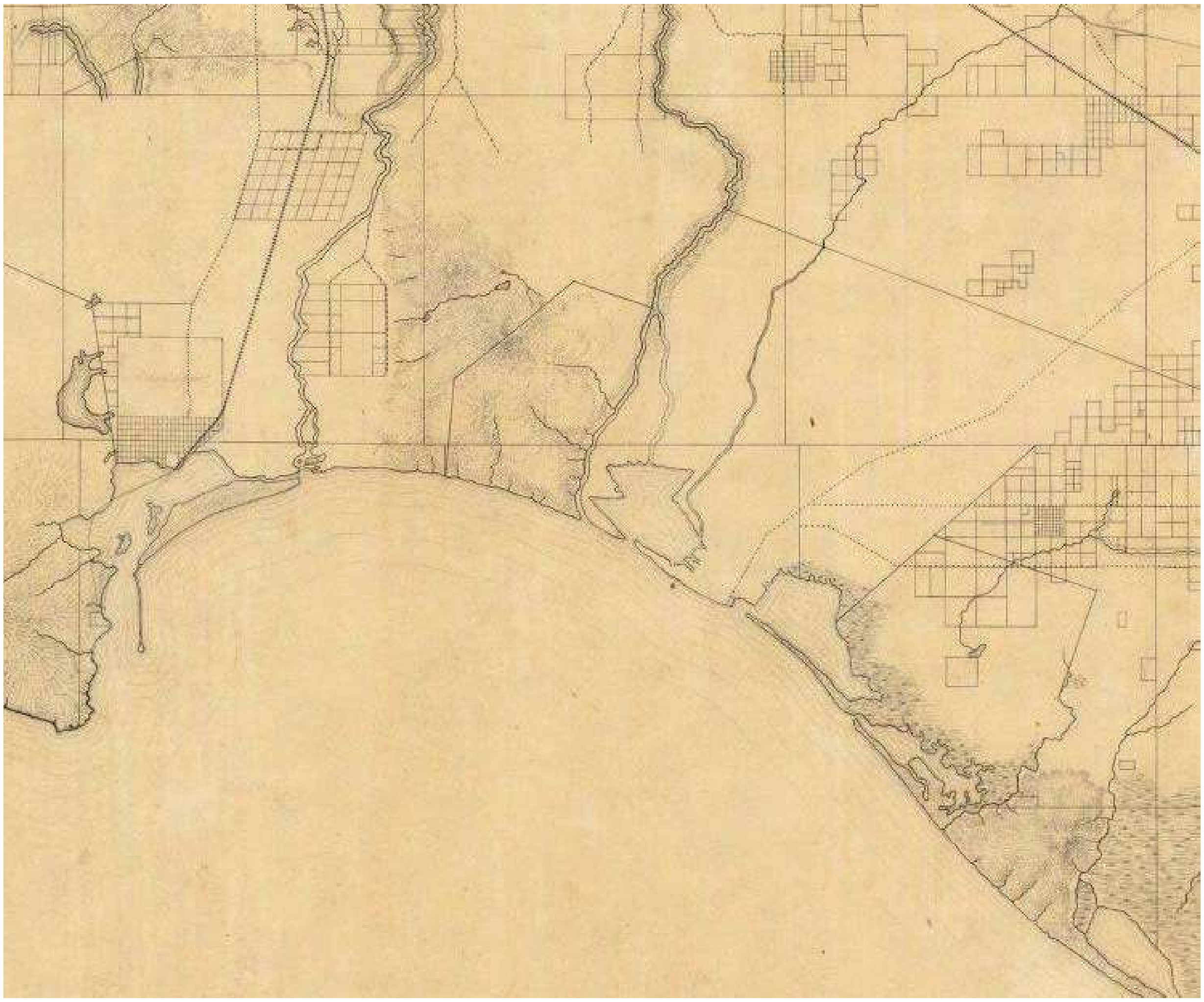

Figure 2. Portion of a circa 1880 drawing by William H. Hall of Los Angeles showing the San Pedro Bay coastline, estuaries, and ocean contours (Hall 1880). The future Port of Long Beach is in the center-left of the drawing.

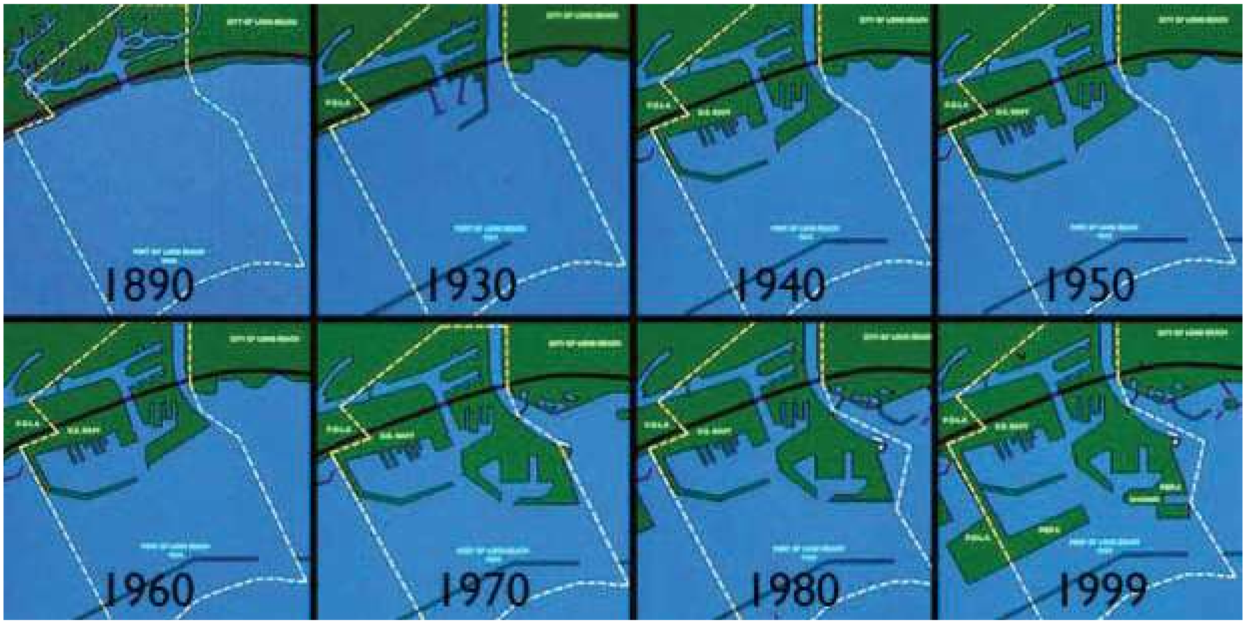

Figure 3. Drawings showing development progression of the Port since 1890 (Port 2014).

Description of the Project Area

The main project site is the Port of Long Beach and is located on the Pacific coast of southern California in western San Pedro Bay, at the southern end of the City, in southern Los Angeles County. The Port is less than 2 miles southwest of downtown Long Beach and about 25 miles south of downtown Los Angeles. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east is the community of Seal Beach. Other areas that could be included in the Project area are local beaches or the open ocean for dredge disposal; the project dredge disposal areas are currently undetermined.

Two competing and independent commercial ports, the Port of Los Angeles and the Port of Long Beach, share the San Pedro Bay marine ecosystem. These man-made harbors have been created through over a century of dredging and filling of the former 3,450-acre Wilmington Lagoon and surrounding areas. The Port of Los Angeles and Port of Long Beach encompass 7,500 acres and 7,600 acres of land and water, respectively. The Port consists of: 3,000 acres of land, 4,600 acres of water, 10 piers, and 80 berths. Uses within both ports are largely industrial, although a variety of other uses (e.g., recreation, commercial fishing) are also supported.

The Port of Los Angeles and Port of Long Beach are both considered deep-water constructed ports, and do not have siltation problems like ports located in natural rivers (natural river ports) (LA/LBHSC 2016). The vast majority of sediments deposited in the ports are carried by the Los Angeles River, Dominguez Channel, and several smaller local creek/storm drains (LA/LBHSC 2016). Due to the region's Mediterranean climate, these channels carry significant quantities of storm water on rare occasions during the winter, and most of the silt settles out near the inlet mouths (LA/LBHSC 2016). As such, the ports need only to be dredged occasionally to maintain berth side design water depths (LA/LBHSC 2016).

The Port has 65 deep-water berths; all of these berths lay within three miles of the open sea, and are reached via the Port's Main Channel which has depths of minus 76 feet at Mean-Lower-Low-Water (MLLW) (LA/LBHSC 2016). The maximum ship draft in the Main Channel is currently limited to 65 feet (LA/LBHSC 2016). Dredging outside the Long Beach Breakwater Entrance Channel has deepened that area to minus 76 feet at MLLW (LA/LBHSC 2016). The Port is currently engaged in a capital development program (CDP) that includes but is not limited to dredging, terminal redevelopment, transportation, and public safety projects (LA/LBHSC 2016). Major components of the CDP include capital dredging in the West Basin and Inner Harbor Turning Basin, and in-water fill within the East Basin (LA/LBHSC 2016). The CDP includes the Middle Harbor Redevelopment Program, the replacement of the Gerald Desmond Bridge spanning the Back Channel, several rail infrastructure projects, and proposed security operations and support facilities (LA/LBHSC 2016). Though not a Port project, Caltrans is currently engaged in the replacement of the Commodore Schuyler Heim Bridge (SR-47) spanning the Cerritos Channel; it will be converted from a lift bridge to a fixed bridge (LA/LBHSC 2016).

Port of Long Beach Water Depths (LA/LBHSC 2016):

Federal Channels in the Port	Current Depth	Current Width
Main Channel	-76 feet	360 – 1500 feet
Back Channel	-52 feet	220 feet
Inner Harbor (Turning Basin)	-52 feet	960 feet
Cerritos Channel	-50 feet	325 feet
Channel 2	-37 to -55 feet	150 – 250 feet
Channel 3	-36 to -45 feet	150 – 200 feet

The outer limit of the Port is defined by breakwaters that were constructed during the early to mid 1900's (MEC 2002). The majority of the harbor waters within the Port currently range in water depth from 30 to 60 feet (MEC 2002) with navigation channels dredged to depths of 45 feet and greater (Service 2000). The adjacent Port of Los Angeles contains several hundred acres of waters currently shallower than 20 feet, primarily constructed by sub-aquatic fill of deeper areas performed to increase marine biological functions. The relative bathymetry[7] of the areas within and around the ports of Long Beach and Los Angeles can be seen in Figure 4.

[7] Bathymetry: the measurement of the depths of oceans, seas, or other large bodies of water, and the data derived from such measurement.

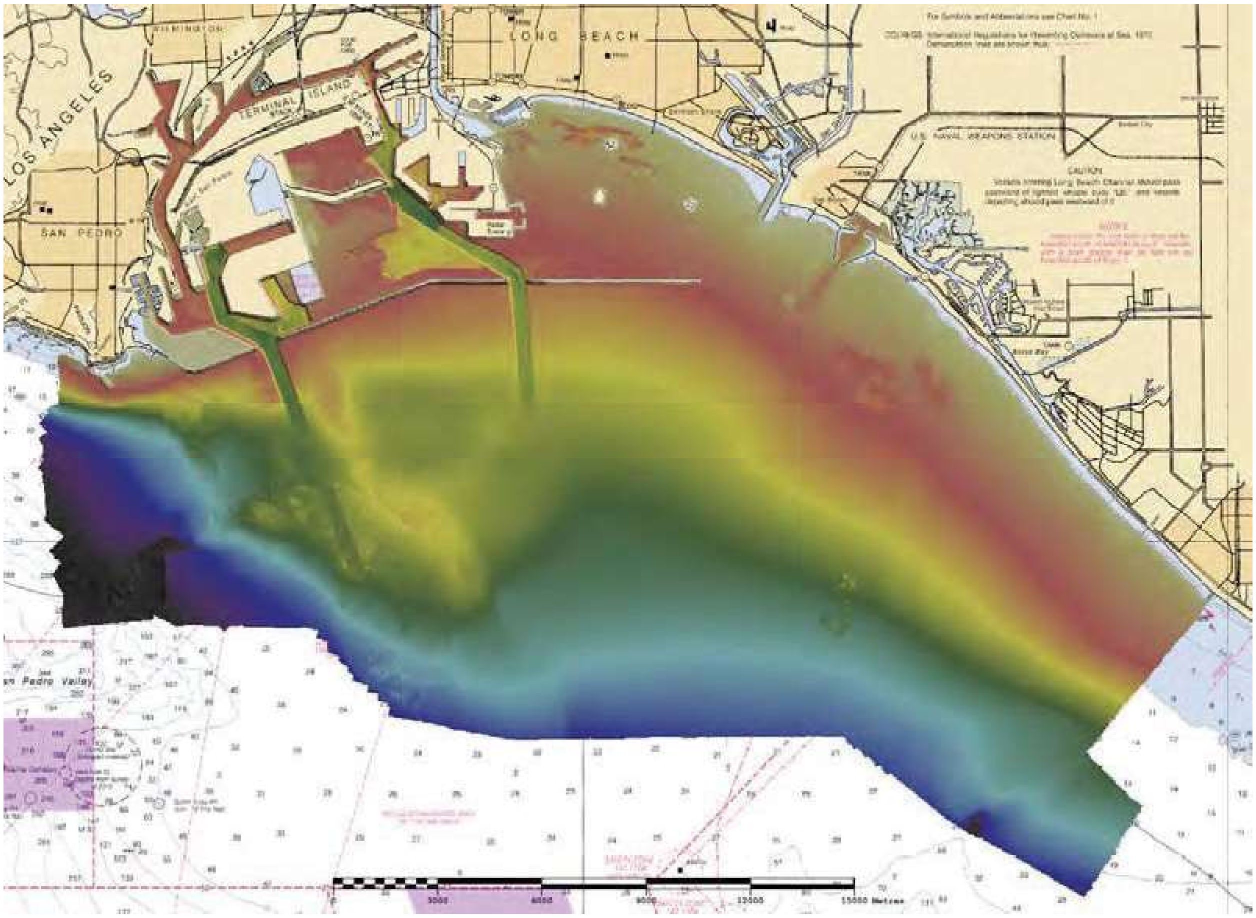

Figure 4. Relative bathymetry of the ports of Long Beach and Los Angeles and environs to highlight the deeper waters in the ports. (NOAA 2015)

Corps Study/Project Area

The Corps' study area for the proposed project includes the waters in the immediate vicinity (and shoreward) of the Port breakwaters throughout most of the Port, and the upstream reaches of the Los Angeles River that have direct impact on the San Pedro Bay, as well as the entire Port facility, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (Corps 2015). The Corps' current Project Area is shown in Figure 5 (Corps 2016).

Project Description

The Corps, with the Port as the local sponsor, is considering the feasibility of deepening navigation channels within the harbor to increase water depths necessary to accommodate deeper draft ships in the Port. The proposed channel depths and methods to accomplish this are currently undetermined. The proposed project's proposed footprint areas are shown in Figure 5. Additional details regarding work areas have not been provided to the Service. Other project footprint areas could include areas within and/or outside the Port for dredge material disposal.

Figure 5. Corps Draft Project Area and Areas of Interest (Corps 2016)

The proposed project would require disposal site(s) for dredge materials. These sites are currently undetermined, but are expected to potentially include sites within the Port area, open-ocean, and/or nearby beach areas, depending in-part on sediment qualities and contaminant constituents in dredge materials (as determined through the testing requirements in 40 CFR §230). Re-use of dredge materials for sand replenishment on beaches near the Port is often desired by the Corps and locals where sediments are appropriate.

Background

The Port has undergone significant development and expansion in the past century (Corps 2015). In the last three decades, the ports of Los Angeles and Long Beach have undertaken accelerated long-range development efforts to increase the shipping and commercial capacity of the ports; both of the ports have become major transportation and trade centers. International commerce is almost 20 percent of the U.S. gross domestic product, and about 95 percent of these products arrive or leave the country in ships (Gray 2001). The Port provides the shipping terminals for nearly one-third of the waterborne trade moving through the west coast of the United States (Corps 2015).

The Port of Long Beach and the Port of Los Angeles are ranked sixth and eighth in tonnage in the United States respectively, moving a combined 139.2 million metric tons (DOT 2012). Trade currently valued annually at more than $155 billion moves through the Port, making financially it the second-busiest seaport in the United States (Corps 2015). To handle this high volume of trade, Port facilities include 10 piers, 80 berths, and 66 post-Panamax gantry cranes (Corps 2015). The Port has 22 shipping terminals to process break bulk (e.g., lumber, steel), bulk (e.g., salt, cement, and gypsum), containers, and liquid bulk (e.g., petroleum) (Corps 2015). Each year the Port handles more than 6 million Twenty-foot Equivalent Units (TEUs)[8] and 75 million tons of cargo, and has over 2,000 vessels call (Corps 2015). Items from clothing and shoes to toys, furniture and consumer electronics arrive at the Port before making their way to stores throughout the country (Corps 2015). Specialized terminals also move petroleum, automobiles, cement, lumber, steel and other products (Corps 2015). The Port's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port (Corps 2015). Top imports are crude oil (16 million metric tons annually), electronics, plastics, and furniture (with inbound container tonnage on the order of 22 million tons annually), while top exports are petroleum products, chemicals, and agricultural commodities (Corps 2015). Currently, about one-third of liquid bulk and container cargo by weight is transported on vessels that could potentially experience operating constraints associated with the current channel depths in the Port (Corps 2015).

Under keel clearance for larger ships in the Port is important in terms of the depth of the seafloor and the static draft of the vessel transiting above it (NOAA 2015). This takes into play many elements: water level is the most obvious and important contributor to this equation. The term "tide" captures the astronomic contribution of the rise and fall of the sea's surface, whereas water level takes into account weather effects and riverine runoff contributions (NOAA 2015). In addition to the water levels, the other factors that must be considered include meteorological conditions, the vessel's motion induced by the prevailing sea state, the static draft of the vessel, the variation in this draft due to the vessel's motion through the water (dynamic draft), and the chemical composition of the water the vessel is sailing in, primarily salinity (NOAA 2015).

The large sizes of the many new trade ships are outsizing some of our waterways. Some Ultra Large Crude Carriers (ULCCs) entering the Port of Long Beach are carrying more than a million gallons of crude oil and are loading to drafts of 65 feet (NOAA 2015). Depending on the sea state in the approach channels of the Port, the ship's pitching may bring the hull close to the Port channel floor (NOAA 2015).

The channel leading into the Port of Long Beach currently has an authorized depth of 76 feet and local regulations allow drafts of 69 feet for ships with a displacement of up to 420,000 tons (NOAA 2015). In late 2012, at a Harbor Safety Committee meeting for the ports of Los Angeles and Long Beach, the Jacobsen Pilots[9] noted that during storms and long period swell conditions outside of the breakwater, ULCCs demonstrated significant levels of pitch[10] in high wave situations (NOAA 2015).[11] As a result, the Captain of the Port froze the maximum draft at 65 feet until they understood the effects of the swells on the ULCCs and could better predict their behavior (NOAA 2015). The effect

[8] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).
[9] Jacobsen Pilots is the sole ship piloting company for the Port of Long Beach.
[10] Pitch is the up/down rotation of a vessel about its lateral/Y (side-to-side or port-starboard) axis.
[11] As a point of reference, a 1,000-foot vessel pitching just 1 degree will experience an increase in draft of more than 10 feet (NOAA 2015).

of reducing the allowed under keel clearance means that ULCCs must wait outside of the sea buoy until conditions are favorable to make the transit into the Port of Long Beach, or lighter to another vessel in order to reduce their draft; both are expensive delays (NOAA 2015).

Presently the largest containerships dock primarily at one of two piers—Pier J or Pier T West Basin (Corps 2015). Access to south berthing area of Pier J is through a secondary channel connected to the Long Beach main access channel; that secondary access channel limits drafts to about 43 feet (Corps 2016). Access to the northern berthing area of Pier J is off the Southeast Basin and does not have this depth limitation (Corps 2016). About 20 years ago a small share of container vessels had to restrict drafts, utilize tides, or both (Corps 2015). However, the impact to operations has increased in the past few years due to the increasing share of larger containerships calling on the port (Corps 2015). Today containerships docking at south berthing area of Pier J have maximum operating drafts of 52 feet and over 7.5 million of the 36.6 million tons of container cargo in 2012 was handled by vessels at or near the 43-foot limit of the secondary access channel (Corps 2016).

Currently, light loading, and tidal delays increase transportation costs for goods transported on containers, and in the future the impact is expected to worsen (Corps 2015; Corps 2016). If sufficiently dredged, containerships with capacities of over 18,000 TEUs (e.g., 1300 feet long, 176 feet beam,[12] drafts approximately 52 feet) would be capable of operating fully loaded in the Port (Corps 2016). Thus, addressing operating constraints to containerships has the potential to significantly lower transportation costs (Corps 2015).

Through agreements with the Service and other resource agencies, the Port has restored some coastal wetlands in southern California in exchange for development approvals of various Port areas. The Port has participated in substantial wetlands restoration projects, including one at the National Wildlife Refuge in Seal Beach. In addition, the Port contributed $39 million toward acquisition of 267 acres of degraded wetlands in Bolsa Chica Lagoon (Bolsa Chica Lowlands Restoration Project) in Huntington Beach (Port 2015).

Project Goals and Objectives

The proposed channel deepening project would allow large, deeper draft ships access to terminals within the Port. The Corps' stated planning goal is to provide safe, reliable, and efficient waterborne transportation improvements to the Port that address problems and opportunities as outlined herein. The Corps' planning objectives are specified as follows:

1. Reduce the cost of transporting cargo to and from the Port by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages; and

2. Reduce expected future vessel re-routings from the Port to alternate facilities by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages.

[12] The beam of a ship is its width at the widest point as measured at the ship's nominal waterline.

Description of Biological Resources

The Port of Long Beach represents a large harbor complex typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge maintained shipping channels (SAIC 2010). The fish and wildlife resources of the Port and San Pedro Bay are reported in substantial detail in a 2000 biological baseline report entitled "Ports of Los Angeles and Long Beach Year 2000 Biological Baseline Study of San Pedro Bay" (MEC 2002). This information was updated with additional survey efforts in 2008 in a report entitled "Final 2008 Biological Surveys of Los Angeles and Long Beach Harbors" (SAIC 2010). A brief summary of the available information is provided herein, based primarily on these two baseline reports. The biological resource groups of San Pedro Bay that are typically considered the most important are the marine fishes and water-associated birds.

The benthic hard substrates in the ports are mostly artificial breakwaters and barriers of riprap (boulders and concrete rubble), and constructed shallow water areas in the ports (LA/LBHSC 2016). Kelp beds typically dominate the hard substrates, with surfgrass natural community potentially existing in waters less than 10 feet deep (LA/LBHSC 2016). Soft bottom substrates comprise the majority of acreage in the two ports (LA/LBHSC 2016). No eelgrass beds were identified within the Port of Long Beach (SAIC 2010). One area just outside the Port's boundary line northeast of Island Grissom[13] was identified as supporting a sizeable eelgrass bed (SAIC 2010). The water column within the ports provides important habitats for many fish, larvae, and plankton, seals, and sea lions (LA/LBHSC 2016).

Fish

Fish populations of San Pedro Bay (including the ports of Los Angeles and Long Beach and environs) are diverse and relatively abundant (SAIC 2010). During surveys conducted in 2000, a total of 74 species were recorded and an estimated 44 million fish occupied the 2 ports. Surveys of the 2 ports in 2008 identified total of 62 fish taxa representing 59 unique species of fish (SAIC 2010). Generally, schooling fishes were the most abundant species recorded.

Northern anchovy (*Engraulis mordax*) and white croaker (*Genyonemus lineatus*) were the most abundant species collected in 2000 surveys; white croaker was top ranked in terms of biomass (MEC 2002). From 2008 surveys in the two ports, pelagic fish from lampara[14] net collections were dominated by four species: northern anchovy, topsmelt (*Atherinops affinis*), California grunion (*Leuresthes tenuis*), and Pacific sardine (*Sardinops sagax*). These species accounted for 98 percent of the total lampara net catch in 2008. All of these species are schooling fishes that spend most of their lives in the harbor environment. From 2008 otter trawl[15] surveys, dominant species included northern anchovy, white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), shiner surfperch (*Cymatogaster aggregata*), and white surfperch (*Phanerodon furcatus*). Other species

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[13] One of a set of four artificial oil production islands in San Pedro Bay off the coast of Long Beach.
[14] A lampara net is a type of fishing net used for capturing certain pelagic fish, those swimming near the water's surface.
[15] In otter trawling, a large net is dragged along the bottom or up in the water column behind a towing vessel. The mouth of the net is held open by two large "doors" which are attached to either side of the net. For the noted surveys performed in 2000 and 2008, trawl surveys were performed to capture bottom-dwelling demersal fish.

caught in high abundance were specklefin midshipman (*Porichthys myriaster*), California tonguefish (*Symphurus atricauda*), and yellowchin sculpin (*Icelinus quadriseriatus*).

The five most abundant species accounted for 92 percent of the total fish populations in the ports (MEC 2002). These included northern anchovy, white croaker, queenfish, Pacific sardine, and topsmelt. Other relatively abundant species included shiner surfperch, salema (*Xenistius californiensis*), and jacksmelt (*Atherinopsis californiensis*). Less numerous but ecologically and/or recreationally important species recorded were California barracuda (*Sphyraena argentea*), California halibut (*Paralichthys californicus*), barred sand bass (*Paralabrax nebulifer*), California corbina (*Menticirrhus undulatus*), white seabass (*Atractoscion nobilis*), California grunion (*Leuresthes tenuis*), and several species of sharks and rays.

In 2000, generally fewer species were caught in the Inner Harbor than Outer Harbor (MEC 2002). Benthic invertebrates, which represent an important food source for demersal fish,[16] also exhibited a trend of decreasing function of habitats from Outer to Inner Harbor areas (MEC 2002). In 2008 surveys, few differences were observed for pelagic fish between Inner and Outer Harbor areas, with Inner Harbor stations having between 4 and 12 species and Outer Harbor stations typified by between 3 and 11 species (SAIC 2010). This likely indicates that pelagic schooling species move throughout the harbor complex (SAIC 2010). In contrast, Outer Harbor areas generally were typified by a greater number, biomass, and variety of trawl-caught (demersal) fish than Inner Harbor areas (SAIC 2010).

More species of fish were collected in the shallow waters of the ports of Los Angeles and Long Beach, including all three of the created shallow water mitigation sites within the Port of Los Angeles, than at deepwater survey stations in open water, channel, basin, and slip habitats (MEC 2002). The greater diversity is likely partially explained by the greater heterogeneity associated with the shallow water habitats, which were adjacent to rock riprap and/or vegetated areas (e.g., eelgrass beds, kelp bed); this likely results in higher fish nursery function, greater production, and generally higher abundance of fish in shallow waters. For instance, the Cabrillo Shallow Water Habitat area is located alongside the San Pedro Breakwater, which supports giant kelp and other macroalgae; the Long Beach Shallow Water Habitat area is located adjacent to the riprap shoreline along Pier 400 that supports giant kelp and other macroalgae, and extensive eelgrass beds occur within the Pier 300 Shallow Water Habitat. Studies conducted in the shallow areas of the Outer Harbor, including the Pier 300 Shallow Water Habitat (MEC 1988, 1999) created in 1984 and the Cabrillo Shallow Water Habitat (MEC 1999) constructed in 1997, have shown that these areas have both higher diversity and greater abundance of fish and invertebrates than the deeper soft bottom portions of the ports of Los Angeles and Long Beach (MEC 2002). A greater abundance of juvenile fish is also present in these shallow areas; they appear to enter these areas relatively soon after hatching/birth. Long Beach fishing experts often fish adjacent to the four manmade oil production islands located within the overall Port boundaries,[17] due to the abundance of recreational fish found there; the abundance of recreational fish in these areas is reportedly due to shallow water combined with high relief from the riprap placed around the created islands (Ballanti 2007).

[16] Fish dwelling at or near the bottom of a body of water.
[17] The islands are controlled by the City of Long Beach and are not part of the Port's Harbor District.

Forty-four unique species of fish larvae and 13 categories of fish eggs were identified in the ports of Los Angeles and Long Beach during the 2000 surveys (MEC 2002). The most abundant fish larvae were gobies [arrow goby (*Clevelandia ios*), cheekspot goby (*Ilypnus gilberti*), shadow goby (*Acentrogobius nebulosus*), and bay goby (*Lepidogobius lepidus*)], northern anchovy, California clingfish, queenfish, blennies, and white croaker. With the exception of the Pier 300 Shallow Water Habitat (in the Port of Los Angeles) that had high larval abundance and the Long Beach West Basin with low larval abundance, the abundances of larvae were generally higher on the Long Beach side of the two-port complex. This bears some similarity to the abundance pattern indicated for adult fish caught by lampara net surveys, which generally showed higher abundance in the deepwater channel, basins, and slips in the Port of Long Beach (MEC 2002). The larval catch was dominated by benthic associated gobies, which inhabit burrows. The ichthyoplankton surveys provided a good measure of the importance of species inhabiting burrows or associated with rocky and/or vegetated habitats in the Long Beach-Los Angeles port complex (MEC 2002). These species (while poorly represented in the adult fish surveys), are an important part of the overall ecology of the diverse marine habitats in the two ports. The ichthyoplankton results also demonstrate that a wide variety of fish spawn and develop within the ports of Los Angeles and Long Beach. Similar to the previous baseline study (MEC 2002), the only exotic (non-indigenous) fish species collected in the 2008 sampling surveys was the yellowfin goby (*Acanthogobius flavimanus*), collected at three Port of Los Angeles stations and six Port of Long Beach Harbor stations (SAIC 2010).

Benthic Invertebrates

Over 400 species of benthic infauna (small organisms that live on and within the sediment) and larger macroinvertebrates were collected during the Year 2000 Baseline Study; over 250 species of benthic infauna and larger macroinvertebrates were collected during the Year 2008 Baseline Study (MEC 2002; SAIC 2010). Small infaunal organisms (which tend to be less motile than larger macroinvertebrates) and larger macroinvertebrates both exhibited spatial variability in species composition that appeared to be tied to a combination of factors including water depth, years since dredging/disposal in the area, and ecological/habitats functions (MEC 2002). Studies in 2008 found little difference in species composition among deepwater stations located in basins, channels, or slips of the Inner and Outer Harbors (SAIC 2010).

Benthic invertebrate assemblages generally differed between shallow and deepwater habitats (SAIC 2010), and differences were apparent between assemblages from areas that have or have not experienced recent dredging (MEC 2002). Areas of recent dredging had fewer species and lower abundance than non-dredged areas, indicating that the recently dredged areas were still in the colonization phase (MEC 2002). Species assemblages of benthic invertebrates can be indicative of habitat function (SAIC 2010). Certain species are tolerant of adverse environmental conditions, such as low oxygen and high pollutant conditions, and others are found only in more pristine areas (SAIC 2010). In the 2008 study, species assemblages indicated that stations in the Outer Harbor had the highest habitat function as indicated by relatively greater abundance of species that typically characterize areas having background to low organic enrichment (i.e., low pollution) (SAIC 2010). The species assemblages found in the Inner Harbor, basins, and slips were indicative of low to moderate organic enrichment compared to the open-water Outer Harbor stations, suggesting that benthic invertebrate species composition is influenced by tidal circulation in the harbors, with Outer Harbor areas having greater circulation and higher functional habitats (SAIC 2010).

Non-indigenous invertebrates comprise about 15 percent of the infauna and macroinvertebrate species occurring in the ports, with some of these species representing numerical dominants (SAIC 2010). The relative abundance of these species has increased in the harbors since the 1970s (SAIC 2010). A total of 10 non-indigenous (introduced) and 32 cryptogenic species (of unknown origin) were identified among the 313 species of infauna and macroinvertebrates collected during the 2008 study (SAIC 2010). The overall percentage of introduced and cryptogenic species identified in the present study (14 percent) is similar to the 15 percent reported by MEC (2002) in 2000 (SAIC 2010).

In general, ecological/habitats function was highest for benthic invertebrates at the created Cabrillo, Pier 300, and Long Beach Shallow Water Habitat areas and the deep open waters of both ports (MEC 2002). A gradient of decreasing ecological/habitats function was observed in basin and slip habitats and the back channels of the Inner Harbor. Similar to fish, catch abundance was higher in basin habitats in the Port than in the open waters of the Outer Harbor (SAIC 2010). The lowest catch of benthic invertebrates was obtained in the Inner Harbor (SAIC 2010).

A steady improvement in benthic ecological/habitats function within the ports of Los Angeles and Long Beach over time has occurred, as demonstrated by increased diversity and less dominance by pollution tolerant benthic infauna species over the past half century. Many areas in both ports were severely polluted in the 1950s with depauperate benthic faunal assemblages in these areas during that period (MEC 2002) (please see Contaminants below).

Birds

Southern California's coastal areas, including its shorelines, estuaries, bays, and developed harbors, provide a variety of natural and artificial communities for large numbers of waterfowl, shorebirds, wading birds, and birds that forage from the air. The predominately open water and hardscape/landscape habitats within the ports of Long Beach and Los Angeles provide opportunities for nesting, foraging, and resting by a moderate diversity of bird species, including one species listed as endangered under the ESA, the California least tern.

Birds that occur in and near the ports of Los Angeles and Long Beach are primarily water-associated species; that is, they are dependent on the marine natural communities for food and other essentials. Over 100 avian species use the various habitats within the Ports seasonally, year-round, or during migration (SAIC 2010). The areas within and near the ports provide very limited areas of trees and/or shrubs for feeding, resting, and/or nesting; most of this small area of vegetation is made up of exotic landscaping. As a result of the high numbers of small fish in the shallow water areas of the ports, substantial numbers of fish-eating birds are found foraging in these areas. The ports provide high-function habitats for many foraging, resting, and breeding birds.

During the 2000-2001 monitoring year, a total of 99 bird species, representing 31 families, were observed within San Pedro Bay (MEC 2002). A total of 96 species representing 30 families were observed within the ports during the 2008 study (SAIC 2010). Of these species from both studies, 69 are considered to be dependent on marine habitats. Gulls comprised 44.5 percent of the birds observed in 2000, with aerial foragers (22.4 percent) and waterfowl (21.4 percent) also common. The remaining 21.7 percent of the birds were small and large shorebirds, wading/marsh birds, raptors, and upland birds. The most abundant birds included several gull species [e.g., Western (*Larus occidentalis*), Heermann's (*L. heermanni*), and California (*L. californicus*)], brown pelican (*Pelecanus occidentalis*), elegant tern (*Thalasseus elegans*), western grebe (*Aechmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicillata*), and rock pigeon (*Columba livia*).

The State and Federal endangered California least tern is a piscivorous (fish eating) sea bird that makes significant breeding use of San Pedro Bay (KBC 2005). The least tern has a long history of nesting on Terminal Island and Pier 400 in the Port of Los Angeles (Figure 4). Pier 400 is near the western portion of the proposed project footprint. This least tern nesting site is typical of those used by the species in highly developed coastal California; the site is a relatively flat, open, barren sandy area near the ocean where the least terns lay and incubate their eggs and chicks fledge. The least tern nesting period extends from April through August; along the California coast least terns typically begin to arrive (from wintering grounds) in the southern most colony breeding sites (e.g., San Diego) in early April and they continue to arrive through the later part of May. During the remainder of the year, the birds are gone from the area.

Least terns nest on sparsely vegetated substrates, including sandy beaches, salt flats, and dredge spoil, in colonies of a few to several hundred nesting pairs. This species relies on sight for foraging and usually requires relatively clear water to locate its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt (LSA 2009). Although there is some field evidence to suggest that least terns will forage in turbid waters to which fish are attracted, the majority of foraging occurs in clearer waters (LSA 2009).

The location of the tern nesting site(s) in the ports of Los Angeles and Long Beach previously varied from year to year (KBC 1998) depending largely on development activities in the ports, with most nesting on Pier 400. The Los Angeles Harbor Department manages the Pier 400 nesting site pursuant to a Memorandum of Agreement with the Service, Corps, and California Department of Fish and Wildlife (Department) (LA 2006). A 15.7-acre fenced nesting site is located at the southern tip of Pier. 400, although some nesting by least terns also often occurs outside of this designated area.

Least terns have nested within the ports since the late 1800s and have been observed within the harbor almost every year since annual monitoring studies began in the ports in 1973 (SAIC 2010). Since 1973 the least tern has utilized nesting locations on and around Terminal Island, with nesting at Reeves Field and/or Pier 300 and Pier 400 areas (LAHD 2015). Zero least tern nesting pairs were recorded for the Terminal Island area in 1992 (LAHD 2015). The greatest documented nesting activity for the least tern in the area has occurred since the birds began utilizing the then newly-constructed Pier 400 as a nesting site in 1997. The number of recorded nests at Pier 400 peaked at 1,322 in 2005, then declined to 906 in 2006, and further declined to 710 in 2007 (KBC 2007) and 126 in 2014 (State 2015). The principal foraging areas for least tern in the ports and environs vary somewhat from year to year, but during the chick rearing period, the shallow water areas of the ports are used heavily, probably due to the relatively greater abundances of appropriate prey fish (size and species) found there (see MEC 1988, 1999). Measures to protect the least tern during channel dredging and landfill construction projects have proven successful (Service 1992). Those measures have included nesting area and predator management, shallow water area conservation/creation, and protection of water quality in the shallow water areas during breeding season.

Least tern nest numbers at Pier 400 increased from approximately 565 during the 2000–2001 to 1,332 in 2005, and then declined to 521 in 2008 (SAIC 2010). The decrease in nest numbers is opined to be related to increases both in upland vegetation and predation at the Pier 400 nesting site (KBC 2008). The majority of least tern observations during 2007–2008 surveys were of individuals foraging or flying in the vicinity of the Pier 400 nesting site; least terns also were observed foraging along the outer breakwater and open-water areas of the Outer Harbor and within Inner Harbor basin and channel areas (SAIC 2010). Least terns foraged most frequently just off the Pier 400 nesting site, off Pier 300, and near Cabrillo Beach (SAIC 2010).

The brown pelican, formerly federally listed as endangered, is found in large numbers in San Pedro Bay (MEC 2002). This bird breeds on the offshore Channel Islands, and forages widely along the southern California coast on small fishes. Brown pelicans make heavy use of the Outer Harbor breakwaters for roosting. The brown pelican is present throughout the year. The peregrine falcon (*Falco peregrinus*), also formerly federally listed as endangered, nests on bridges within the area of the ports (SAIC 2010).

Several piscivorous seabirds began nesting in the adjacent Port of Los Angeles following construction of Pier 400. The royal tern (*Thalasseus maximus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and black skimmer (*Rynchops niger*) had each been recorded nesting on Pier 400 up until 2005 (KBC 2005). No nesting by these species was recorded in 2006 or 2007 (KBC 2007). The landfill area of Pier 400 (constructed in 1996) initially provided a large expanse of suitable bare-dirt nesting habitat for terns adjacent to a well-developed forage base (consisting of small fish) in the Outer Harbor. However, development of Pier 400 is now complete and undeveloped areas in the ports of Los Angeles and Long Beach outside of the Pier 400 nesting site currently contain very little suitable seabird nesting habitats.

No snowy plovers were detected within either the ports of Long Beach or Los Angeles during the 2007–2008 surveys (SAIC 2010). Snowy plovers are occasionally observed during migration at the California least tern nesting site on Pier 400 (SAIC 2010). A few snowy plovers have been observed at nearby Point Fermin and Cabrillo Beach (outside of the breakwater), both south and outside of the Port of Los Angeles (SAIC 2010).

Mammals

Most marine mammals are under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA Fisheries), including all those potentially occurring in or near the ports. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq*.) and some are also protected by the ESA. Marine mammals that are known to occur sporadically in waters of the ports include pinnipeds [California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*)] and cetaceans (SAIC 2010). Cetaceans that have been observed in outer harbor locations in the ports include the gray whale (*Eschrichtius robustus*), Pacific bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) (SAIC 2010). None of these are species are known to breed in the ports (SAIC 2010).

Riprap-Associated Organisms

A total of 334 species of invertebrates were identified from three tidal zones within the riprap community in the ports (SAIC 2010). Distinct tidal zonation was observed with increasing numbers of species with increasing depth. Mean total abundance was highest in the lower intertidal, lowest in the upper intertidal, and intermediate in the subtidal zone (SAIC 2010). Across all tidal zones, crustaceans were numerically dominant, followed by polychaetes, echinoderms, molluscs, and other phyla. Past studies have noted relatively greater community development in Outer Harbor compared to Inner Harbor areas (MEC 1988, 2002). However, the 2008 study noted general similarities in these communities throughout the two ports (SAIC 2010). Exceptions were for diversity, which was somewhat greater at Outer Harbor breakwater stations compared to Inner Harbor locations, but these differences were mainly associated with the upper intertidal zone (SAIC 2010). Community summary measures did not show distinct trends among Inner and Outer Harbor stations for the lower intertidal and subtidal zones, suggesting some improvement in ecological function at Inner Harbor stations since the 2000 study (SAIC 2010).

Kelp and Macroalgae

Within the ports, the majority of kelp and macroalgae surface canopy is closely associated with the outer breakwaters and with riprap structures in the Outer Harbor and in locations facing the port entrances (SAIC 2010). While algal diversity in the ports is considered relatively low, there is a general pattern of decreasing algal diversity from Outer to Inner Harbor locations (SAIC 2010). During the 2008 study, Macrocystis canopy in the two ports totaled 77.8 acres in spring and decreased to 50.4 acres in the fall (35% decrease) (SAIC 2010). Seasonal declines in kelp canopy cover for both studies are likely due to natural die-offs between winter and fall. Dominant macroalgal communities included the genera *Sargassum*, *Ulva*, *Colpomenia*, *Chondracnathus*, and *Halymenia* (SAIC 2010).

Occurrences of invasive exotic algae within the ports include the brown algae *Sargassum muticum* and *Undaria pinnatifida*. While *Sargassum* has become a commonly observed component of the algal flora in southern California, including the ports, *Undaria* was first reported in the United States in spring 2000 during the previous baseline study of the ports (MEC 2002). Notably, *Undaria* was documented during the present study at all eight Inner Harbor sites studied and at 7 of 12 Outer Harbor locations, indicating an expanded distribution since 2000 (SAIC 2010).

Contaminants

The marine biological environment of the ports of Los Angeles and Long Beach has been periodically studied since the 1950s. Early studies documented severe pollution in several of the basins in the harbors. As recently as the late 1960s, dissolved oxygen (DO) levels at some locations in Los Angeles Harbor were so low that little or no marine life could survive (SAIC 2010). Since that time, regulations have reduced direct waste discharges into the ports, resulting in improved DO levels throughout the port areas (MEC 2002; SAIC 2010). Comprehensive studies in the 1970s reported a dramatic improvement in marine habitats function/quality relative to the 1950s, although areas of pollution are still evident in Inner Harbor and blind-end slip areas (MEC 2002).

Results from studies in 2000 and 2008 indicate a continued trend of water quality improvement since the 1970s, with most DO concentrations in excess of 5 milligrams/liter (MEC 2002; SAIC 2010). Episodic and localized changes in some parameters, such as low DO concentrations coinciding with low transmissivity, suggested minor effects possibly associated with sediment resuspension events (MEC 2002). Water clarity (transmissivity) decreased with increasing depth and was relatively lower in bottom waters at stations with fine sediments and/or in the vicinity of dredging and/or disposal (MEC 2002). Polluted and "semi-healthy" areas still exist in the ports; however, the spatial extent of these areas of relatively poorer ecological/habitats function is not as widespread today. The most polluted area is the Consolidated Slip of the Port of Los Angeles; "semi-healthy" areas exist in the Cerritos Channel of the Inner Harbor and in confined basins and slips in both ports (MEC 2002).

Water quality conditions measured during July 2008 generally were uniform throughout the environments of the ports, with only minor differences that appeared to be unrelated to natural community (SAIC 2010). Further, water quality conditions also were consistent with values reported previously for the ports (MEC 2002), and indicative of well-mixed and well-oxygenated waters (e.g., DO greater than 5 mg/L) for almost all stations (SAIC 2010). Some localized differences, associated with comparatively warmer surface water temperatures, lower surface water salinities, and lower DO concentrations in near-bottom water, were observed, but the magnitude of the differences were considered small (SAIC 2010).

The waters of ports of Los Angeles and Long Beach (including Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach), San Pedro Bay, Dominguez Channel, Dominguez Channel estuary, Torrance Lateral Channel (sometimes referred to as Torrance Carson Channel), and Los Angeles River Estuary are impaired by heavy metals and organic pollutants (CRWQCB 2011). More specifically, each of these water bodies are included on the 303(d) list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, and certain PAH compounds (CRWQCB 2011). These impairments may exist in one or more environmental media — water, sediments, or tissue (CRWQCB 2011).

Some site specific data are available that suggest varying levels of contamination in the sediments to be dredged. Additional testing will be required to determine what materials from which areas may be re-used for habitat creation or beach replenishment, disposed of at an ocean dumping site, or disposed of at a confined disposal facility or appropriate upland site. The Service will provide additional input on these determinations as information regarding physical and chemical characteristics of the materials to be dredged becomes available.

San Pedro Bay Landfill Mitigation History

The agency consensus mitigation goal for San Pedro Bay (ports of Los Angeles and Long Beach) landfill impacts to date has been no net loss of habitat value for in-kind resources, as near to the site of loss as feasible, and in advance of, but not later than concurrently with, the fill (Corps and LAHD 1992). For the last several years, the Service, Department, the National Marine Fisheries Service, the City of Los Angeles Harbor Department, and the Port have been designing and executing mitigation plans for development projects in the ports. The process employs a modified habitat evaluation procedure and involves evaluation of the habitat value in the affected port area and compares that to predicted habitat value increases at conceptual mitigation areas.

Following implementation of measures for avoiding and minimizing impacts to fish and wildlife resources, on-site mitigation has been conducted in the adjacent Port of Los Angeles consisting of creation of shallow water from deep areas. In 1985, as a condition of the Harbor Deepening Project in the Port of Los Angeles, the Corps created 190 acres of shallow water (i.e., water less than -20 feet MLLW) as mitigation for the filling of 190 acres of shallow water to make the land area now called Pier 300. The created shallow water area, now called the Pier 300 Shallow Water Habitat, has been the subject of several biological investigations (MEC 1988, 1999) and shown to provide highly productive habitats for fish. It is also an important foraging area for the California least tern (KBC and Aspen Environmental Group 2004).

Potential Impacts of the Proposed Project on Biological Resources

The proposed project would involve deepening of portions of the Port to currently undetermined depths with the disposal of dredge material at currently undetermined locations. The project would involve dredging of only relatively deep (i.e., greater than 20 feet) water areas of San Pedro Bay. These deeper water impacts typically do not involve what is considered significant long-term loss of habitats warranting mitigation.[18] Anticipated potential effects associated with dredging and disposal of dredge materials would depend largely on disposal location; these potentially include: 1) the permanent elimination of fish and wildlife habitats associated with any in-bay landfills; 2) a temporary reduction in available foraging habitat for piscivorous bird species, including the least tern, due to dredging or disposal-associated turbidity generated by the project (depending on locations); 3) the reduction of deep water habitats and creation of shallow water fish habitats with any in-bay subaquatic fill of deeper waters; 4) the reduction of deepwater habitats and creation of island (nesting bird) habitats with any in-bay island fill of deeper waters; and 5) temporary impacts of burying of beach- and nearshore-associated invertebrates and nearshore turbidity associated with disposal of dredge materials through local beach/nearshore replenishment.

The dredging of deeper water areas within the project footprint would impact the invertebrate benthic fauna and demersal fish communities found in these areas. These dredging impacts would be largely temporary, although the resultant areas would then be deeper in the long-term. The replacement benthic fauna that would colonize these dredged areas in the years following project

[18] Historically, mitigation has been required for dredging that deepens shallow water areas, 20 feet deep or less, because the deepening reduces or eliminates the fish nursery and bird foraging values. No such impacts to areas less than 20 feet deep are anticipated with this project.

implementation would likely be different; this fauna would include species combinations adapted to these new deeper areas. The vast majority (if not all) of these areas have been subject to dredging in the past century, with varying levels of recovery since the last dredging event. It is undetermined what areas of the project footprint would be subject to future maintenance dredging.

The dredging and disposal of dredge materials creates temporary turbidity impacts to surrounding waters. When dredge materials are used to create shallow water or island habitats this typically creates long-term benefits due to the typically higher functions and values for fish and wildlife attributable to shallow water and sensitive species nesting areas. The size and duration of the turbidity plume generated by dredging and disposal activities is dependent on grain size of the suspended material and current velocities at the time the activity is conducted (Corps and LAHD 2000). Project dredge material qualities, disposal locations, and associated current velocities are unknown; therefore, turbidity is not readily predictable for the project. The amount of turbidity is generally greater in the immediate vicinity of the filling/disposal operations than at the dredge site because the dredge typically operates with suction, while the filling operation is often by discharge from a pipe (Corps and LAHD 2000). However, based on past dredge disposal operations, the extent of the turbidity plume is not expected to be greater than several hundred feet from the discharge point. Because several hundred acres of high-function shallow water foraging habitat are available for piscivorous bird species within the Port region (e.g., 193-acre Pier 300 Shallow Water Habitat and 326-acre Cabrillo Shallow Water Habitat), the area of disturbance from the project would likely represent a small portion of available foraging habitats for such birds.

Recommendations

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Consistent with Fish and Wildlife Coordination Act, should the project be implemented, we suggest incorporation of the following planning aid recommendations in order avoid, minimize, and compensate potential impacts to fish and wildlife resources, and suggest the Corps incorporate the project design elements outlined below that would improve fish and wildlife resources:

1. The Corps should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, the Corps should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters.[19] The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

[19] We suggest these locations so as to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by these measures.

A portion of the island should have a zone of low gradient shoreline slope down to the water within a protected cove(s), likely adjacent to and facing the existing breakwater within the Port for swell protection. Other features such as subaquatic reefs constructed of rock are also suggested, in part to help prevent erosion of the island cove shoreline surface materials from swells. The configuration and slope surface of the noted cove should be constructed of sand and gravel or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack[20] and would otherwise support snowy plover chick and adult foraging. The remainder of the island (outside of the cove portion) would likely need to be edged by riprap to avoid erosion of the island by swells. Possibly waste rock from other proposed projects in the area (e.g., partial or full removal of the Long Beach Breakwater) could be used/combined for this purpose. It is preferred that the surface of this island not be utilized for human recreation and be protected from unauthorized entry.

3. The Corps should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. The Corps should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by the Corps, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

   a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, the Corps should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

   b. Visually monitor and report to the dredging contractor or Corps contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the Corps biologist be notified immediately. An appropriate buffer zone around the nest for

[20] Beach wrack consists of organic material such as kelp and sea grass that is cast up onto the beach by surf, tides, and wind. Beach wrack supports a wide variety and large quantity of beach invertebrates.

exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

If you have any questions you have regarding this letter, please contact Jon Avery, Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

CAROL ROBERTS Digitally signed by CAROL ROBERTS Date: 2016.06.30 15:09:09 -07'00'

Scott A. Sobiech
Deputy Field Supervisor

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