APPENDIX F

MARINE BIOLOGICAL RESOURCES ASSESSMENT TECHNICAL REPORT

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Prepared for

San Diego Regional Water Quality Control Board
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Marine Biological Resources Assessment

Technical Report

Shipyard Sediment Remediation Site
National Steel and Shipbuilding Company (NASSCO)
BAE Systems San Diego Ship Repair, Inc.

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1. INTRODUCTION

The proposed project is the dredging of sediment adjacent to shipyards in the San Diego Bay, the dewatering and possible solidification of the dredged material on-shore, potential treatment of decanted water, and the transport of the removed material to an appropriate landfill for disposal. The purpose of the project is to implement a Tentative Cleanup and Abatement Order (CAO) issued by the California Regional Water Quality Control Board, San Diego Region (hereinafter the San Diego Water Board). The San Diego Water Board is the Lead Agency under California Environmental Quality Act (CEQA) for the proposed project. The dredging will occur in an area of the Bay defined in the Tentative CAO. The San Diego Water Board is considering the use of one or more staging sites for the dewatering and treatment of the dredge material, as further described in this project description. The sediment remediation footprint and the optional staging sites comprise the project site for the purpose of this study.

There are two scheduling options for completion of the remedial action. The first scheduling option is expected to take 2 to 2.5 years to complete. Under this option, the dredging operations would occur for 7 months of the year and would cease from April through August during the endangered California least tern breeding season.

The second option is to implement the remedial plan with continuous dredging operations, which would be expected to take approximately 12.5 months to complete. Also assumed under this compressed schedule option is that dredging operations could proceed year-round, including during the breeding season of the endangered California least tern, which ranges from April through August of each year.

Both scheduling options would be followed by a period of post-remedial monitoring. The preferred schedule will be determined during the final design phase. However, both schedule options are included in the analysis for this technical study.

1.1 Project Location

The sediment removal site is located along the eastern shore of central San Diego Bay, extending approximately from the Sampson Street Extension on the northwest to Chollas Creek on the southeast, and from the shoreline out to the San Diego Bay main shipping channel to the west (Figure 1). The project consists of the removal of marine sediments in the bottom bay waters that contain elevated levels of pollutants above San Diego Bay background conditions. This area is hereinafter collectively referred to as the "Shipyard Sediment Site".

The Shipyard Sediment Site is more specifically bounded by the waters of R.E. Staite facility on the north, the 28th Street Pier on the south, the open waters and shipways of San Diego Bay on the west, and the shoreline of three leaseholds on the east (San Diego Gas & Electric Co., and two shipyard facilities on the east; the BAE Systems San Diego Ship Repair Facility [BAE Systems] and the National Steel and Shipbuilding Company Shipyard Facility [NASSCO]). The Shipyard Sediment Site (also referred to as the Proposed Remedial Footprint in the Draft Technical Report for Tentative CAO) is comprised of approximately 15.2 acres subject to dredging and 2.3 acres subject to clean sand cover, primarily under piers. The project consists of marine sediments in the bottom bay waters that contain elevated levels of pollutants above San Diego Bay background conditions. The removal of the marine sediments will require upland areas for dewatering, solidification and stockpiling of the materials and potential treatment of decant waters prior to offsite disposal. Therefore, in addition to the open waters of the Shipyard Sediment Site, five upland areas have been identified by the San Diego Water Board as Potential Sediment Staging Areas. Each of the potential staging areas has more defined usable areas, which are presented in Figure 2 and further described below.

- Staging Area 1 – 10th Avenue Marine Terminal and Adjacent Parking (approximately 49.66 potentially usable acres)
- Staging Area 2 – Commercial Berthing Pier and Parking Lots Adjacent to Coronado Bridge (approximately 11.66 potentially usable acres)
- Staging Area 3 – SDG&E/BAE Systems BAE Systems and NASSCO Parking Lot (approximately 7.27 potentially usable acres)
- Staging Area 4 – NASSCO/NASSCO Parking and Parking Lot North of Harbor Drive (approximately 3.85 potentially usable acres)
- Staging Area 5 – 24th Street Marine Terminal and Adjacent Parking Lots (approximately 145.31 potentially usable acres)

1.2 Regulatory Setting

Regulations pertaining to species and habitat protection and management are described below.

1.2.1 United States Army Corps of Engineers

Section 404 of the Clean Water Act. The United States Army Corps of Engineers (ACOE) regulates discharges of dredged or fill material into waters of the United States (U.S.). The term "waters of the U.S." is defined at 33 Code of Federal Regulations (CFR) Part 328 and includes (*1*) *All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce…*, (*2*) *all interstate waters and wetlands*, (*3*) *all other waters such as intrastate lakes*, *rivers*, *streams* (*including intermittent streams*), *mudflats*, *sandflats*, *wetlands*, *sloughs*, *prairie potholes*, *wet meadows*, *playa lakes*, *or natural ponds*, *the use*, *degradation or destruction of which could affect interstate or foreign commerce*, (*4*) *all impoundments of waters mentioned above*, (*5*) *all tributaries to waters mentioned above*, (*6*) *the territorial seas*, *and* (*7*) *all wetlands adjacent to waters mentioned above*. Wetlands are defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Waters found to be isolated and not subject to Clean Water Act (CWA) regulation are often still regulated by the San Diego Water Board under the State Porter-Cologne Water Quality Control Act (Porter-Cologne Act), as discussed below.

Section 10 of the Rivers and Harbors Act. Section 10 of the Rivers and Harbors Act requires authorization from the ACOE for the creation of any obstruction to the navigable capacity of any of the waters of the U.S. ACOE approval is necessary to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the U.S. In addition, ACOE approval is necessary to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the U.S.

1.2.2 San Diego Unified Port District Master Plan

The San Diego Unified Port District (SDUPD) Master Plan is intended to provide the official planning policies for the physical development of the tide and submerged lands granted to the SDUPD (SDUPD, 1996). The Shipyard Sediment Site is located under the planning jurisdiction of the SDUPD and is identified as District 4 in the certified Port Master Plan. The SDUPD is a special government entity, created in 1962 by the

San Diego Unified Port District Act, California Harbors and Navigation Code, in order to manage San Diego Harbor and administer certain public lands along San Diego Bay. The SDUPD may use the powers and authority granted to protect, preserve, and enhance the physical access to the Bay, the natural resources of the Bay (including plant and animal life), and the quality of waters in the Bay (Section 4[b]; SDUPD, 1996). The SDUPD holds and manages as trust property on behalf of the People of the State of California, including the land occupied by NASSCO and BAE Systems and all five potential staging areas with exception to a portion of the proposed acreage at Potential Staging Area 4 (Figure 2). Approximately 2.49 usable acres north of East Harbor Drive are in the jurisdiction of the City of San Diego. The Port Master Plan water use designation within the limits of the proposed project is Industrial – Specialized Berthing or Marine –Related Industrial.

1.2.3 Porter-Cologne Water Quality Control Act.

The federal CWA places the primary responsibility for the control of water pollution and for planning the development and use of water resources within the states, although it does establish certain guidelines for states to follow in developing their programs.

California's primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Board (Regional Water Board) broad powers to protect water quality and is the primary vehicle for implementation of California's responsibility under the federal CWA. The Porter-Cologne Act grants the State Water Board and Regional Water Boards the authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil, or petroleum product.

Each Regional Water Board must formulate and adopt a water quality plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the State Water Board in its State water policy. The Porter-Cologne Act also provides that a Regional Water Board may include in its region a regional plan with water discharge prohibitions applicable to particular conditions, areas, or types of waste. The Regional Water Boards are also authorized to enforce discharge limitations, take actions to prevent violations of these limitations from occurring, and conduct investigations to determine the water quality status of any of the

waters of the State within their region. Civil and criminal penalties are also applicable to persons who violate the requirement of the Porter-Cologne Act or State Water Board/orders.

1.2.4 Regional Water Quality Control Board (San Diego Water Board)

Waters subject to the provisions of Section 404 of the CWA also require Water Quality Certification from the San Diego Water Board pursuant to Section 401 of the CWA. Waters that do not fall under the jurisdiction of the San Diego Water Board pursuant to Section 401 of the CWA may require authorization through application for waste discharge requirements (WDRs) or through waiver of WDRs, pursuant to the Porter-Cologne Act (California Water Code, Division 7).

1.2.5 United States Fish and Wildlife Service

The Federal Endangered Species Act (FESA) of 1973 sets forth a two-tiered classification scheme based on the biological health of a species. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range. Threatened species are those likely to become endangered in the foreseeable future; Special Rules under Section 4(d) can be made to address threatened species. Ultimately, the FESA attempts to bring populations of listed species to healthy levels so that they no longer need special protection.

If a federal action exists and the project may impact listed species or designated critical habitat, consultation with the United States Fish and Wildlife Service (USFWS) is required through Section 7 of the FESA. By law, Section 7 consultation is a cooperative effort involving affected parties engaged in analyzing the effects posed by proposed actions on listed species or critical habitats. The FESA prohibits the "take" of listed species by anyone unless authorized by the USFWS. Take is defined as "conduct which attempts or results in the killing, harming, or harassing of a listed species." Harm is defined as "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering." Harassment is defined as an "intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, including breeding, feeding, or sheltering." Therefore, in order to comply with the FESA, any proposed project should be assessed prior to construction to determine whether the project will impact listed species or, in the case of a federal action on the project, designated critical habitats.

Section 7 of the FESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of federal lands as well as other federal actions that may affect listed species, such as federal approval of private activities through the issuance of federal permits, licenses, or other actions.

Section 7(a)(2) of the FESA requires all federal agencies, in consultation with and with the assistance of the Secretary of the Interior, to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat. This includes any federal action including funding, licensing, permitting, authorizing, or carrying out activities under their jurisdictions. By law, Section 7 consultation is a cooperative effort involving affected parties engaged in analyzing effects posed by proposed actions on listed species or critical habitat(s).

1.2.6 California Department of Fish and Game

The California Department of Fish and Game (CDFG), through Sections 1600–1603 of the California Fish and Game Code, is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. CDFG defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation."

The CDFG regulates wetland areas only to the extent that those wetlands are a part of a river, stream, or lake as defined by CDFG. While seasonal ponds are within the CDFG definition of wetlands, if they are not associated with a river, stream, or lake, they are not subject to jurisdiction of CDFG under Section 1602 of the California Fish and Game Code. No Streambed Alteration Agreement (SAA) is required for the proposed project.

The California Endangered Species Act (CESA; California Fish and Game Code Sections 2050–2098) was signed into law in 1984. It was intended to parallel the federal law. The CESA prohibits the unauthorized "take" of species listed as threatened or endangered under its provisions. However, a significant difference exists in the CESA definition of "take," which is limited to actually or attempting to "hunt, pursue, capture, or kill." CESA provisions for authorization of incidental take include consultation with a State agency, board, or commission that is also a State Lead Agency pursuant to

CEQA; authorization of other entities through a 2081 permit; or adoption of a federal incidental take authorization pursuant to Section 2081.1. Similar to the FESA, actions in compliance with the measures specified as a result of the consultation process or 2081 permit are not prohibited.

1.2.7 California Coastal Commission

The California Coastal Commission (CCC), through provisions of the California Coastal Act, is empowered to issue a Coastal Development Permit (CDP) for many projects located within the Coastal Zone. In areas where a local entity has a certified Local Coastal Program (LCP), the local agency can issue a CDP only if it is consistent with the LCP. The CCC, however, has appeal authority for portions of LCPs and retains jurisdiction over certain public trust lands and in areas without an LCP.

The CCC regulates the diking, filling, and dredging of wetlands within the Coastal Zone. The Coastal Act Section 30121 defines wetlands as lands "within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens." The waterside portions of the Shipyard Sediment Site bayward of the pier head line are regulated and reviewed by the CCC. The Shipyard Sediment Site is artificially stabilized and the shoreline is predominantly made up of sheet pile bulkheads and seawalls. Therefore, no areas within the Shipyard Sediment Site contain wetlands as per the CCC definition. Additionally, the Potential Staging Areas located in the Coastal Zone do not contain wetlands as per the CCC definition.

1.2.8 National Marine Fisheries Service

The National Oceanic and Atmospheric Administration Marine Fisheries Services (NOAA Fisheries [NMFS]) receives its ocean stewardship responsibilities under many federal laws, including the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Most important are the FESA, which protects species determined to be threatened or endangered; the Marine Mammal Protection Act (MMPA), which regulates interactions with marine mammals; the Lacey Act, which prohibits fish or wildlife transactions and activities that violate State, federal, Native American tribal, or foreign laws; the Fish and Wildlife Coordination Act, which authorizes NOAA Fisheries to collect fisheries data on environmental decisions that affect living marine resources; and the federal Power Act, which allows NOAA Fisheries to minimize effects of dam operations on anadromous fish, such as prescribing fish passageways that bypass dams. Many other statutes, international conventions, and treaties also guide NOAA Fisheries activities.

Magnuson-Stevens Fishery Conservation and Management Act. The MSA was amended in 1996 and requires the NMFS to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a federal FMP. The 1996 amendments to the MSA set forth a number of new mandates for the NFMS, eight regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat. The councils, with assistance from NMFS, are required to delineate EFH for all managed species. EFH is defined as the waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Specifically, the MSA requires: (1) federal agencies to consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that could adversely affect EFH; (2) NMFS to provide conservation recommendations for any federal or state action that could adversely affect EFH; and (3) federal agencies to provide a detailed response in writing to NMFS within 30 days of receiving EFH conservation recommendations.

Essential Fish Habitat. The proposed project is located within a general area designated as EFH by two Fishery Management Plans (FMPs), the Coastal Pelagic and the Pacific Coast Groundfish FMPs. Species managed under the Highly Migratory Species FMP may have EFH within the project area, but EFH has not been designated for these species under the MSA. In addition, because these are highly mobile species, these species are likely to be transient rather than stationary at the Shipyard Sediment Site. Salmonids have designated EFH within another FMP; however, there currently is no critical habitat designated in San Diego Bay. Therefore, it is highly unlikely they would occur in the project area and as such, they are not addressed further in this report.

EFH species are discussed in further detail in Section 3.0 Fisheries Management Plan Species.

1.2.9 Species Protection under Regulatory and Local Policies

Nesting Birds. The federal Migratory Bird Treaty Act (MBTA) regulations and portions of the California Fish and Game Code prohibit the "take" of nearly all native bird species and their nests. While these laws and regulations were originally intended to control the intentional take of birds and/or their eggs and nests by collectors, falconers, etc., they can nevertheless be applied to unintentional take (e.g., destroying an active nest by cutting down a tree). It is sometimes possible to obtain a permit for relocating or removing a nest.

Marine Mammals. All marine mammals are protected by the MMPA. In addition, some marine mammal species are listed as endangered or threatened by the FESA. NMFS is the federal agency charged with the responsibility of enforcing the provisions of the MMPA. The MMPA forbids the taking (including harassment, disturbance, capture, and death) of any marine mammals except as set forth in the Act. Therefore, none of the construction activities are legally permitted to disturb marine mammals or disrupt their activities or behavior in known migration routes, feeding areas, or breeding areas.

Sea Turtles. All sea turtle species listed under FESA are listed as either endangered or threatened. The USFWS and the NMFS are the federal agencies charged with the responsibility of enforcing the provisions of the FESA. FESA forbids the taking (including harassment, disturbance, capture, and death) of any sea turtles except as set forth in the Act. Therefore, none of the operational activities are legally permitted to disturb sea turtles or disrupt their activities or behavior in known migration routes, feeding areas, or breeding areas.

1.2.10 Marine Protected Areas

The Marine Life Management Act (MLMA) (Assembly Bill 1241; Statutes of 1998, Chapter 1052) directs the state to redesign California's system of marine protected areas (MPAs) to function as a network in order to: increase coherence and effectiveness in protecting the state's marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational and study opportunities provided by marine ecosystems subject to minimal human disturbance. Three types of MPA designation types are used in the MLMA process: state marine reserves, state marine parks and state marine conservation areas.

MPAs are primarily intended to protect or conserve marine life and habitat, and are therefore a subset of marine managed areas (MMAs), which are broader groups of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities.

The MLMA was enacted to promote sustainable marine fisheries, primarily through FMPs based on the best readily available scientific and other relevant information. Rather than assuming that exploitation should continue until damage has become clear, the MLMA shifts the burden of proof toward demonstrating that fisheries and other activities are sustainable. Also, rather than focusing on single fisheries management, the

MLMA requires an ecosystem perspective including the whole environment. FMPs are prepared by the CDFG and submitted with implementing regulations for review and approval by the California Fish and Game Commission. FMPs have been prepared for abalone (*Haliotis* spp.), herring, squid, white seabass (*Atractoscion nobilis*), and nearshore fisheries.

The MLMA has identified five study regions: the north coast region, the north central coast region, the San Francisco Bay region, the central coast region, and the south coast region. The central coast region was selected as the initial study region from which to launch the MLMA. The south coast study region MPA, where the Shipyard Sediment Site resides, was developed in December 2010 and becomes effective in summer 2011 (http://www.dfg.ca.gov/mlpa - website visited March 2011). At this time, the MLMA does not identify a MPA in San Diego Bay in its south coast study region (CDFG, 2008).

1.2.11 San Diego National Wildlife Refuge

Located in the southern portion of the Bay, the San Diego Bay National Wildlife Refuge, consisting of the Sweetwater Marsh and South San Diego Bay Units, was dedicated in 1999 and includes 3,940 acres. Under a Comprehensive Conservation Plan, it includes intertidal salt marsh and submerged areas with eelgrass beds. It is the largest remaining contiguous mudflat in Southern California and is an important stop for migrating birds on the Pacific Flyway. It includes some former salt evaporation ponds which the USFWS is attempting to convert back into natural wetland.

The Refuge provides habitat for seven federally listed endangered and threatened species: the endangered California least tern (*Sterna antillarum browni*), light-footed clapper rail (*Ralluslongirostris levipes*), California brown pelican (*Pelecanus occidentalis californicus*), and salt marsh bird's beak (*Cordylanthus maritimus maritimus*); and the threatened western snowy plover (*Charadrius alexandrinus nivosus*), Pacific green sea turtle (*Chelonia mydas*), and California gnatcatcher (*Polioptila californica californica*). Of these species, the least tern, clapper rail, and snowy plover all nest on the Refuge.

Four of the federally listed endangered species supported by the Refuge, including salt marsh bird's beak, California least tern, light-footed clapper rail, and California brown pelican, are also listed as endangered by the State of California. The salt marsh habitat within this Refuge also supports the Belding's savannah sparrow, another species listed by the State as endangered.

The Refuge also supports 26 species identified by the USFWS as Birds of Conservation Concern. Of these species, the gull-billed tern, elegant tern, and black skimmer nest at the South Bay Salt Works site.

1.3 Marine Setting and Site Conditions

San Diego Bay is designated as a State Estuary under Section 1, Division 18 (commencing with section 28000) of the Public Resources Code. The San Diego Bay shoreline between Sampson and 28th Streets is listed on the Clean Water Act section 303(d) List of Water Quality Limited Segments for elevated levels of copper, mercury, zinc, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) in the marine sediment. These pollutants are impairing the aquatic life, aquatic-dependent wildlife, and human health beneficial uses designated for San Diego Bay. The northeast boundary of the Shipyard Sediment Site occupies this shoreline.

The principal structural components within the Shipyard Sediment Site include the concrete bulkheads, piers and dry dock facilities associated with the two shipyard facilities. Bathymetry at the site varies substantially due to the presence of shipways, dry docks, and berths and ranges from -2 feet Mean Lower Low Water (MLLW) along the bulkheads to -70 feet MLLW at the BAE Systems dry dock sump area (Figures 3 and 4).

The five potential staging areas consist primarily of leasehold lands and associated parking areas in the immediate vicinity of the Shipyard Sediment Site. The actual usable areas within each potential staging area are comprised of open, paved portions that could be used for the dewatering, solidifying and drying of the dredged marine sediments. Staging Areas 1 through 4 are located within the City of San Diego and are designated in the City's General Plan as Industrial Employment. Staging Area 5 is located within the City of National City and is designated in the City's existing General Plan as Industrial – Tidelands Manufacturing and is under the jurisdiction of the Port District. National City is currently updating their General Plan; the proposed Land Use designation for Staging Area 5 in the updated General Plan is Marine-Related Industrial.

Tides within the bay are classified as mixed diurnal/semidiurnal, which result in a higher high tide preceding the lower low tide (Largier, 1995). Tidal action results in strong tidal flushing in the north end of the Bay, but relatively low flushing in the central and southern portions (MacDonald et al., 1990) where the Shipyard Sediment Site is located. Due to its narrow entrance and geographical setting, San Diego Bay is

protected from large ocean waves. Wave production within the Bay is generally driven by local winds (MacDonald et al., 1990). Due to their protected location within the Bay, conditions at the Shipyard Sediment Site are relatively quiescent, and are not subject to routine or significant wind, wave or current-driven sediment disturbance events.

San Diego Bay is the largest marine bay and estuary in Southern California and provides important spawning and nursery habitat for marine fish and invertebrates. The marine habitat within the Shipyard Sediment Site consists of 63 open water acres (46 within the NASSCO leasehold and 17 within the BAE Systems leasehold) containing both vegetated and unvegetated subtidal soft bottom habitats, pier pilings and bulkhead walls. The vegetated habitat species include sparse beds of eelgrass (*Zostera marina*). The entire extent of the Shipyard Sediment Site shoreline is artificially stabilized, generally consisting of a vertical sheet pile bulkhead and a seawall. The marine habitat types include vertical bulkhead walls and dock structures, vegetated and non-vegetated soft bottom subtidal habitats, and open water. These habitats support marine plants, invertebrates, and fishes.

The following subsections present a more detailed discussion of the habitats, flora and fauna found in the Bay, and more specifically at the Shipyard Sediment Site. These subsections were developed primarily using information available in the following documents:

- Detailed Sediment Investigation (SI) Report prepared for NASSCO/BAE Systems shipyards (Exponent, 2003);
- Marine Biological Resources and Essential Fish Habitat (EFH) Assessment for the BAE Systems Leasehold Projects (Merkel & Associates, 2010);
- BAE Systems 2010/2011 Dry Dock Sump Maintenance Dredging Project – Project Execution Plan. (BAE Systems, 2010); and
- Silver Strand Training Complex Final Environmental Impact Statement (EIS). Department of Navy. (U.S. Department of the Navy, 2011).

1.3.1 Subtidal Soft Bottom Habitat

Within the Shipyard Sediment Site, the most comprehensive fish and benthic macroinvertebrate sampling was conducted in August 2001 as part of the Phase 1 Sediment Investigation (SI) of the NASSCO and BAE Systems shipyards (Exponent, 2003). Fish were collected inside and outside the shipyard leaseholds using a variety of trawls and hooks. Surface sediment samples were collected at multiple subtidal

locations at both shipyards to evaluate the benthic community living at the Shipyard Sediment Site.

Within this habitat, the 10 most abundant benthic taxa at the shipyards and reference areas were *Lumbrineris* sp., *Exogene lourei*, *Leitoscoloplos pugettensis*, *Mediomastus* sp., *Pista alata,* and *Scyphoproctus oculatus*, the polychaete *Pseudopolydora paucibranchiata*, the molluscs *Musculista senhousia* and *Theora lubrica*, and the crustacean *Synaptotanais notabilis* (Exponent, 2003). Three of these taxa (i.e., *M. senhousia*, *T. lubrica*, and *P. paucibranchiata*) are not native to Southern California and have been introduced to the region.

Benthic macroinvertebrate communities were evaluated using two methods: sediment profile images and collection and enumeration of benthic macroinvertebrates. Benthic macroinvertebrates were collected and enumerated at the 30 triad stations during Phase 1 of the SI (Exponent, 2003). Total numbers of benthic organisms per square meter ranged from 2,800 to 8,600 at NASSCO (excluding a station at the mouth of Chollas Creek), and 3,160 to 31,800 at BAE Systems. Species characteristic of mature benthic communities were found at almost all locations in both shipyards, often in combination with pioneering species.

In September 2010, an assessment of marine biological resources and preparation of an EFH was conducted within the BAE Systems leasehold to support three proposed projects. The projects included: 1) maintenance dredging of the dry dock sump; 2) fender pile replacement for the dry dock mooring dolphin; and 3) Pier 3 fender pile installation. During the September 2010 assessment of marine biological resources and EFH, the subtidal habitat reported the presence of barnacles (*Chthamalus* spp., *Balanus* sp.), which were the most common invertebrates on the bulkhead walls. Invertebrates included colonial tunicates (e.g., *Botryllus* sp.), oysters (*Ostrea lurida*), sponges (*Leucilla nuttingi*), mussels (*Mytilus* sp.), feather duster worms (*Sabillidae*), colonial ascidians (*Botrylloides* sp.), solitary tunicates (e.g., *Ciona* sp., *Styela plicata*), bryozoans (e.g., *Eurystomella* sp.), and the nonnative bryozoan *Zoobotryon verticillatum* (Merkel & Associates, 2010).

Bare mud occurs throughout most of the Shipyard Sediment Site, with depths to -70 ft in the BAE Systems dry dock sump (Exponent, 2003). During the 2010 assessment of marine biological resources and EFH conducted for BAE Systems, few invertebrates were observed on the mud although evidence of burrowing invertebrates, possibly tube dwelling anemones, arthropods (e.g., ghost shrimp, *Callianassa*), or bivalves, were observed. Although only round stingray (*Urobattus halleri*) were observed, other fish

species including barred and spotted sand bass (*Paralabrax nebulifer* and *P. maculatofasciatus*), California halibut (*Paralichthys californicus),* and midshipman (*Porichthys myriaster*) are likely to use this habitat (Merkel & Associates, 2010).

Phase 2 of the SI was carried out in August, September, and November 2002 (Exponent, 2003). The eelgrass distribution at the shipyards was surveyed by divers. Eelgrass was present in the shallowest water (-10 MLLW) near the shore at the east and west ends of both shipyards (Figures 3 and 4).

A total of 10 eelgrass beds were reported within the BAE Systems leasehold (Exponent, 2003: Figure 3):

- Beds 1 through 4 are located along the eastern portion of Pier 4.
- Beds 5 through 7 are located adjacent to the bulkhead wall east of Pier 2.
- Bed 8 is located adjacent to the bulkhead wall between Piers 1 and 2.
- Beds 9 through 12 are located adjacent to the bulkhead wall east of Pier 4.

A total of 13 eelgrass beds were reported within the NASSCO leasehold (Exponent, 2003: Figure 4):

- Beds 1 and 2 are located adjacent to the bulkhead wall along the 24th street dock west of Berth III.
- Bed 3 is located adjacent to the bulkhead wall along the 24th Street Dock between Berths III and IV.
- Beds 4 and 5 are located adjacent to the bulkhead wall just east of Berth IX.
- Beds 6 through 11 are located adjacent to the bulkhead wall between Berths X and XI.
- Beds 12 and 13 are located adjacent to the bulkhead wall west of Berth XII.

Eelgrass was not present in the center of the NASSCO shipyard (between the floating dry dock area and the Graving Dock), where most ship construction and repair activities take place (Figure 4).

During the September 2010 assessment of marine biological resources and EFH conducted for BAE Systems, eelgrass was observed in the shallow water (less than -12 ft MLLW) adjacent to the bulkhead walls (Figure 5) (Merkel & Associates, 2010). The project area was approximately 12.3 acres and was surveyed with sidescan sonar,

remotely operated vehicle (ROV), and biologist divers. A pre-construction eelgrass survey conducted on 6 September 2010 at BAE Systems documented approximately 0.14 acre of eelgrass within the proposed dry dock maintenance dredging area. A reference eelgrass bed located north of BAE Systems Pier 1 documented approximately 0.68 acre of eelgrass. The red alga (*Gracilaria verrucosa*) and the green alga (*Ulva* sp.) were commonly interspersed within the eelgrass beds.

Limited algal growth was reported to occur on the piles (e.g., *Ulva* spp., foliose red algae.). Invertebrates occurring on bulkhead walls, piles, and/or dock structures included: colonial tunicates (e.g., *Botryllus* sp.), oysters (*Ostrea lurida*), sponges (*Leucilla nuttingi*), mussels (*Mytilus* sp.), feather duster worms (*Sabillidae*), colonial ascidians (*Botrylloides* sp.), solitary tunicates (e.g., *Ciona* sp., *Styela plicata*), bryozoans (e.g., *Eurystomella* sp.), and the nonnative bryozoan *Zoobotryon verticillatum*.

1.3.2 Open Water

The pelagic zone is generally composed of a continuous water column. For the purpose of this discussion, the definition of the pelagic zone is the water column and resident organisms that have little interaction with the benthos. Pelagic organisms, such as schooling fish, and drifting plankton, generally remain in the water column.

Marine plankton consists of a diverse collection of plants and animals, all drifting with the current in the water column. Phytoplankton, using carbon dioxide and light energy to construct cell material, represent the beginning of the pelagic food chain. Zooplankton graze on phytoplankton and represent another significant component of the pelagic food chain. In addition to the phytoplankton and zooplankton, which spend their entire life as plankton, the larvae or juvenile forms of numerous other organisms spend time as plankton.

A great number of fish inhabit the pelagic zone, with the northern anchovy (*Engraulis mordax*) one of the most abundant fish in the California Current (Dailey et al., 1993; Emmett et al., 1991) as well as in San Diego Bay (Tierra Data, Inc., 2002). Some pelagic fish, such as northern anchovy and slough anchovy that are usually considered open water schooling fish are frequently found in San Diego Bay associated with the benthic zone (Allen, 1999). The northern anchovy species is considered epipelagic, a designation for fish that are active, grow fast, and reproduce early and often. In the case of northern anchovies, some fish are mature at less than 1 year of age and may spawn up to 20 times. It is abundant in California bays and estuaries during the spring,

summer, and fall, moving offshore and southeast as spawning begins in late winter (Dailey et al., 1993).

1.3.3 Fishes

The types of fishes which commonly occur in protected bays of Southern California such as San Diego Bay are a combination of species that are associated with soft bottom habitat, hardscape of pilings, docks, cement bulkheads and jetties, as well as open water (water column) species. In April and July 2008 and again in June 2009, the Port of San Diego surveyed the estuarine fishes of San Diego Bay in four ecoregions of the Bay; North, North-Central , South-Central, and South (Pondella et al., 2009a and 2009b). The Shipyard Sediment Site and all five Potential Staging Areas are adjacent to the North-Central ecoregion sampled. At each of the four ecoregions surveyed, the following five subhabitats were sampled: deep channel, nearshore non-vegetated, nearshore vegetated, intertidal non-vegetated, and intertidal vegetated.

The goals of the 2008 study were to identify, determine and quantify the utilization of the fishery populations, identify habitats that support juvenile fish species, describe nursery utilization, and determine geographic and/or habitat areas of San Diego Bay that support significant populations of fish species utilized as forage by endangered avian species. The goal of the 2009 study was to determine the abundance and size class structure of avian forage species in San Diego Bay during the critical timing of the least tern breeding season.

During the 2008 and 2009 surveys, 15,692 (48 species) and 5,208 (27 species) fishes were collected, respectively. No ESA fish species were collected during the 2008 and 2009 surveys. Comparing both surveys, 23 of the same species were collected in 2008 and 2009. Twenty-five of the 48 species collected in 2008 were not observed in 2009, and only four of the 27 species collected in 2009 were not observed in 2008. Therefore, a total of 52 different species were collected during these two surveys (Pondella et al., 2009a and 2009b).

The most numerous species caught during both surveys was the slough anchovy (*Anchoa delicatissima*), topsmelt (*Atherinops affinis*), and shiner perch (*Cymatogaster aggregate*). In 2009, the total catch was greatest at the North-Central ecoregion (Pondella et al., 2009b). In terms of biomass, round stingrays (*Urobatis halleri*), spotted sand bass (*Paralabrax maculatofasciatus*), topsmelt, slough anchovy, California butterfly ray (*Gymnura marmorata*), and yellowfin croaker (*Umbrina roncador*)

represented the greatest biomass for fishes (Pondella et al., 2009a and 2009b). In 2009, the total biomass was greatest at the North-Central ecoregion (Pondella et al., 2009b).

Fish in San Diego Bay taken by commercial or recreational fishing and that could be expected to appear at the Shipyard Sediment Site or Potential Staging Areas waterfront locations are listed in Table 1. Those species that support a commercial fishery are indicated with an asterisk. Commercial fishing no longer occurs in San Diego Bay: the last commercial fishery, for striped mullet (*Mugil cephalus*) in south San Diego Bay, ended in 1998. However, seven species inhabiting San Diego Bay support commercial fisheries elsewhere in southern California waters. The most important of these is the California halibut (*P. californicus*). The northern anchovy is taken commercially for use as live bait. In addition, the Pacific sardine is taken as part of this catch. Fish caught for live bait are brought and held in bait receivers located in north San Diego Bay, where they are sold to commercial and recreational fisherman. A much larger group of species are caught within the San Diego Bay by recreational fisherman and by those who fish for subsistence. At least 58 species are involved in the recreational catch.

Table 1: Fish Species of San Diego Bay Taken by Recreational and Commercial Fishermen

Scientific Name	Common Name	Scientific Name	Common Name
Osteichthyes	bony fish	*Pleuronichthys ritteri*	spotted turbot
Atherinops affinis	Topsmelt	*Pleuronichthys verticalis*	hornyhead turbot
Atherinopsis californiensis	Jacksmelt	*Cheilotrema saturnum*	black croaker
Leuresthes tenuis	California grunion	*Atractoscion nobilis**	white seabass
Hippoglossina stomata	bigmouth sole	*Genyonemus lineatus*	white croaker
Xysteurys liolepis	fantail sole	*Menticurrhus undulates*	California corbina
Caranx caballus	green jack	*Roncador stearnsii*	spotfin croaker
Caranx hippos	crevalle jack	*Seriphus politus*	queenfish
Trachurus symmetricus	jack mackerel	*Umbrina roncador*	yellowfin croaker
Chanos chanos	milkfish	*Sarda chiliensis*	Pacific bonito
Clupea harengus pallasii	Pacific herring	*Scomber japonicas*	Pacific mackerel
*Sardinops sagax caeruleus**	Pacific sardine	*Scomberomorus sierra*	sierra

Scorpaena guttata	sculpin	*Medialuna californiensis*	halfmoon
Scorpaenichthys marmoratus	cabezon	*Morone saxatilis*	striped bass
Amphistichus argenteus	barred surfperch	*Paralabrax clathratus**	kelp bass
Cymatogaster aggregata	shiner surfperch	*Paralabrax maculatofasciatus*	spotted sand bass
Damalichthys vacca	pile surfperch	*Paralabrax nebulifer*	barred sand bass
Embiotoca jacksoni	black surfperch	*Sphyraena argentea*	California barracuda
Hyperprosopon argenteum	walleye surfperch	*Albula vulpes*	bonefish
Micrometrus minimus	dwarf surfperch	*Cynoscion parvipinnis*	shortfin corvine
Phanerodon furcatus	white surfperch	Chondrichthyes	sharks and rays
Rhacochilus toxotes	rubberlip surfperch	*Carcharhinus remotus*	narrowtooth shark
*Engraulis mordax**	northern anchovy	*Galeorhinus zyopterus*	soupfin shark
Girella nigricans	opaleye	*Mustelus californicus*	gray smoothhound
*Mugil cephalus**	striped mullet	*Mustelus henlei*	brown smoothhound
Hypsopsetta guttulata	diamond turbot	*Mustelus lunulatus*	sicklefin smoothhound
*Paralichthys californicus**	California halibut	*Prionace glauca*	blue shark
Platichthys stellatus	starry flounder	*Triakis semifasciata*	leopard shark
*Parophrys vetulus**	English sole	*Sphyma zygaena*	smooth hammerhead shark
Pleuronichthys coenosus	CO turbot	*Squalus acanthias*	spiny dogfish

Note: Asterisks indicate species of commercial importance in southern California waters

As mentioned previously, fish sampling was conducted as part of the Shipyard Sediment Site SI; however, fish sampling was not performed to assess abundance or types of fish species present at the shipyards. Rather, fish histopathology was performed on the spotted sand bass (*P. maculatofasciatus*) to evaluate potential exposure of fishes to chemical contaminants found in the shipyard sediments. A total of 253 spotted sand bass were sampled in 2002, in five locations within San Diego Bay:

- Inside the NASSCO shipyard site (50 fish)
- Immediately outside of the NASSCO shipyard site (50 fish)

- Inside the Southwest Marine shipyard site (51 fish)
- Immediately outside of the Southwest Marine shipyard site (50 fish)
- Within a reference area (52 fish).

Fishes were collected using nets and by hook and line. Spotted sand bass were evaluated for lesions and other histopathological conditions. Both indices of fish health indicated that fish at shipyard locations and the reference location were similar. Neither growth nor health of fish at the shipyards was reported to be adversely affected relative to reference conditions. Bile was collected from spotted sand bass to evaluate fish exposure to PAH. No statistically significant differences in PAH breakdown products in fish bile were found at the shipyards relative to the reference location.

2. HABITAT AREAS OF PARTICULAR CONCERN

Impacts to Habitat Areas of Particular Concern (HAPC) are described in the regulations as subsets of EFH which are rare, particularly susceptible to human induced degradation, especially ecologically important habitats, or located in an environmentally stressed area, including estuaries and eelgrass.

The sole applicable designated HAPC for the Shipyard Sediment Site is seagrass habitat (NMFS, 2008). The primary marine seagrass occurring in San Diego Bay is eelgrass (*Zostera marina*). Eelgrass (*Z. marina*) is a marine plant historically found in shallow (+1 to -8 ft MLLW), soft bottom bays and estuaries ranging from Baja to Alaska. It plays an important ecological role via biological/physical benefits including: nursery habitat for commercial/recreational fish (predation refuge and food source), trapping sediment and clarifying water, fed on directly by birds, fish, and invertebrates, and supports epiphytic organisms fed on by others. Eelgrass found in the Bay supports nearly 20 percent of all eelgrass habitats in California (50 percent in Southern California) (NMFS, 2009). The majority of the eelgrass beds in the Bay are found in the southern ecoregions as this area has retained much of its historic shallow bathymetry. Longterm comparisons in the Bay from 1993 (first comprehensive survey in the Bay conducted by the Navy) to 2008 show an increase from 1,061 acres of eelgrass in 1993 to 2,078 acres in 2004. From 2004 to 2008 there was a reported decline from 2,078 to 1,319 acres. However, it appears that eelgrass is expanding in recent decades due to improved water quality and restoration efforts (NMFS, 2009).

Eelgrass (*Z. marina*) is identified as a HAPC for EFH groundfish species. Eelgrass beds are an important component of the San Diego Bay food web. Much of its productivity enters the food web as detritus or decayed material consumed by invertebrates. Fishes and invertebrates, such as juvenile lobster, use eelgrass beds to escape from predators, as a food source, and as a nursery. Fish documented to use eelgrass beds include topsmelt, guitarfish, diamond turbot, bat ray, dwarf perch, arrow goby, jack mackerel, pipefish, Pacific sardine, striped mullet, and walleye surfperch (U.S. Department of the Navy, 2000). The plants provide surfaces for egg attachment and sheltered locations for juveniles to hide and feed. Fish produced from these beds are consumed by fish-eating birds, including the endangered California least tern. Waterfowl, especially surf scoter, scaup, and brant are present in high numbers in late fall and winter in eelgrass beds.

Eelgrass beds are the most productive areas on the soft bottom habitat. Roots and rhizomes help stabilize the unconsolidated substrate by forming an interlocking matrix that inhibits erosion. The plants themselves keep water clearer by trapping fine

sediments and preventing their resuspension (Takahashi, 1992). Leaves cut down wave action and currents; the resulting decrease in turbulence causes more fine sediment to be deposited. Abundant algae and invertebrates that grow on the leaf blades provide primary and secondary productivity for consumption by larval and juvenile fish. Sediments within eelgrass beds are loaded with detrital leaves, rhizomes, and nutrients that fuel infaunal invertebrates. When epibenthic invertebrate abundances are low, this indicates impaired food chain support functions (Rutherford, 1989).

The distribution and density of eelgrass beds are greatly influenced by many factors including available light, water clarity, and nutrient concentration. Temperature, salinity, currents, and the nature of the substrate may serve as other controlling factors for the distribution and abundance of eelgrass. For eelgrass in San Diego Bay, the primary limiting factors are likely available light (including turbid water and shading from permanent structures) and vessel traffic (Tierra Data, Inc., 2002).

In preparation for the 2010 BAE Systems maintenance dredging of the dry dock, fender pile replacement for the dry dock mooring dolphin, and Pier 3 fender pile installation projects, a pre-construction eelgrass survey was performed (Merkel & Associates, 2010). The 6 September 2010 survey found 0.84 acre of eelgrass within the survey limits at the BAE Systems facility (Figure 4). Of the mapped eelgrass, a total of 0.14 acre of eelgrass was mapped in the project survey area in multiple small patches interspersed between piers, bulkheads, and dredged basins, and 0.70 acre of eelgrass was mapped within the reference survey area. Eelgrass did not occur within the proposed dry dock dredging area or within close proximity of the dredging (Figure 5). The nearest eelgrass to the limits of dredging was located 52 meters to the north of the work area within the shallower waters adjacent to the shoreline bulkheads. To protect existing eelgrass beds, BAE Systems employed silt curtains to limit potential drift of incidental turbidity from the dredging operation. In addition, the existing eelgrass beds are located within highly confined regions of the shipyard that are generally inaccessible to large vessels.

3. FISHERY MANAGEMENT PLAN SPECIES

Essential fish species that have been identified by the NMFS and have been documented within San Diego Bay include a variety of fin fish, flat fish, rock fish, and squid. While some of these species are associated with hard bottom substrates, the Shipyard Sediment Site and Potential Staging Areas may include areas that could be considered EFH by either the Coastal Pelagics Fisheries Management Plan (FMP) or the Pacific Groundfish FMP.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) was amended in 1996 to include provisions for the identity and protection of important marine habitat and anadromous fish. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to the NMFS recommendations. The eelgrass habitat known to exist within the Shipyard Sediment Site leasehold qualifies as EFH, and may provide essential habitat for juvenile fish species to grow to maturity, or offer protection for managed species.

A database search through the California Natural Diversity Database (CNDDB) was conducted to identify species that may occur or are likely to occur at the Shipyard Sediment Site and Potential Staging Areas (CDFG, 2011). No fish species listed as Threatened or Endangered occur in San Diego Bay (Appendix A).

Some potential species of concern have been identified in San Diego Bay through other studies (Pondella et al., 2009a and 2009b; Merkel & Associates, 2000; Allen, 1999; Hoffman, 1994). The following analysis makes extensive use of Allen's (1999) data set because it is the most comprehensive survey in the Bay to date (surveys were completed quarterly for five and a half years, at four stations throughout San Diego Bay, utilizing six sampling gear types) with a total of 78 species identified. The other studies reviewed for this analysis are utilized primarily to confirm the presence of fish species and to identify additional species not captured by Allen.

Of these 78 species identified by Allen (1999), six are managed by the NMFS under the Coastal Pelagics Species FMP (Table 2) (NMFS, 2008). Four of the six fish managed under the Coastal Pelagics Species FMP are represented in San Diego Bay. The northern anchovy (*Engraulis mordax*) and pacific sardine (*Sardinops saga*) are the most abundant pelagics identified by Allen, ranking 1st and 4th in abundance, and 3rd and 10th in biomass, respectively (Table 2). Together, these two species accounted for 46.3 percent of the total abundance and 11.6 percent of the total biomass of fish enumerated

by Allen (1999). The pacific mackerel (*Scomber japonicas*) and jack mackerel (*Trachurus symmetricus*) are the other two coastal pelagics of potential concern in the project area. These two species were much less abundant than the northern anchovy and pacific sardine, and were ranked by Allen as 32nd and 52nd in total abundance and 24th and 73rd in total biomass, respectively. Together the two species accounted for less than 1 percent of total abundance and biomass of fish captured (Allen, 1999).

Of the 83 species managed under the Pacific Groundfish FMP (NMFS, 2008), two have been identified in San Diego Bay during the studies analyzed for this assessment: California scorpionfish (*Scorpaena gutatta*) and English Sole (*Parophrys vetulus*). These species were observed only rarely in San Diego Bay during the five-and-a-half years of Allen's study, ranking 41st and 76th by abundance and 24th and 73rd by biomass, respectively (Table 2). These two species were not observed in the 2008 or 2009 surveys conducted by the Vantuna Research Group (Pondella et al., 2009a and 2009b). Together these two species accounted for less than 0.5 percent of the total abundance and biomass of fish captured (Allen, 1999).

Table 2 - Table of NMFS Managed Fish Species Previously Found in San Diego Bay.

Common Name	Scientific Name	Rank	
		Abundance	Biomass
Coastal Pelagics FMP			
Northern Anchovy	*Engraulis mordax*	1st	3rd
Pacific Sardine	*Sardinops sagax*	4th	10th
Pacific Mackerel	*Scomber japonicus*	32nd	17th
Jack Mackerel	*Trachurus symmetricus*	52nd	29th
Pacific Groundfish FMP			
California Scorpionfish	*Scorpaena gutatta*	41st	24th
English Sole	*Parophrys vetulus*	76th	73rd

Note: Rank refers to the relative rankings among 78 fish species observed by Allen (1999).

4. SENSITIVE SPECIES

Some species within the Bay have been designated with a special status under either state or federal laws or regulations. Both the California state and federal endangered species acts provide special protections for a variety of fish, invertebrates, marine mammals, birds, and plants. Marine mammals are also afforded protection under the Federal Marine Mammal Protection Act of 1972 (MMPA), and migratory seabirds and shorebirds found in the Bay are protected under the Migratory Bird Treaty Act. Direct take of some species has been prohibited by laws separate from the above acts, and these laws are found in various sections of the California Fish and Game Code. In addition, the CDFG maintains a list of taxa they are interested in tracking, regardless of the legal or protection status of that taxa. This list of "species at risk" or "special-status species" is comprised of those taxa considered to be of greatest conservation need. The CDFG has also designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. Not all "Species of Special Concern" have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a "threatened" or "endangered" species under the state and/or federal endangered species acts. The section below includes brief descriptions of special-status species that exist within the Bay.

A database search through the CNDDB was conducted to identify special-status species that may occur or are likely to occur at the Shipyard Sediment Site and Potential Staging Areas (CDFG, 2011). The CNDDB search was performed for rare plants and animals that are known to occur in San Diego County and the complete list is presented in Appendix A. Special-status species including birds, fish, marine mammals, and marine reptiles that may occur or are likely to occur at the Shipyard Sediment Site and Potential Staging Areas are discussed below. Special-status species of plants are not discussed in this report because the landside portions of the project site are in a highly industrial area and mostly paved. Therefore, no rare plants are known to occur at the Shipyard Sediment Site or Potential Staging Areas.

4.1 Birds

California Brown Pelican (*Pelecanus occidentalis californicus*). The California brown pelican was formerly listed as endangered under the ESA and CESA, but was delisted in 2009. The California brown pelican was also protected as endangered under the California ESA, but officially delisted in November 2009. This species is a fully

protected species under §3511 of the Fish and Game Code and the Migratory Bird Treaty Act.

The distribution and foraging of the California brown pelican is strongly associated with the water temperatures and availability of fish stocks within particular temperature zones. Brown pelicans are plunge divers and rely on visual detection to capture prey within one meter of the water surface (Fish and Wildlife Information Exchange, 1996). They can be opportunistic or rely on a largely single-species diet. In the Southern California Bight, brown pelicans preferentially (more than 90 percent) feed on northern anchovy, and their population numbers have been so closely correlated with anchovy abundance that they can be considered indicators of the anchovy stocks (Anderson et al., 1980). California brown pelican are colonial nesters utilizing relatively small, inaccessible coastal islands for colony sites.

North American populations underwent dramatic declines during the 1960s and early 1970s due to eggshell thinning induced by dichloro-diphenyl-dichloroethylene (DDE), the primary metabolic breakdown product of the pesticide dichloro-diphenyl-trichloroethane (DDT). Although populations have recovered substantially from these declines, there is considerable interannual variation in productivity as related to prey availability, disturbance at colonies, and disease outbreaks. Breeding effort, productivity, and survival are lower during El Niño events.

While the California brown pelican may occur at the Shipyard Sediment Site or potential staging areas during construction activities, it is expected to avoid these areas due to its high mobility and capability to access other areas of the Bay for feeding and foraging. The Shipyard Sediment Site and potential staging areas is not conducive for nesting or breeding due to its paved industrial setting.

California least tern (*Sterna antillarum browni*). The California least tern is listed by both the USFWS (35 FR 16047 October 13, 1970) and under the California Endangered Species Act as endangered. Historically, the least tern's range extends from San Francisco Bay south to San Jose del Cabo, Baja California Sur, Mexico (Cogswell, 1977; Massey, 1974). Wintering areas are in Mexico and Central America. Human disturbance at former coastal nesting areas has reduced the breeding population in California (Garrett and Dunn, 1981). Disturbance along California beaches for recreational, residential, and industrial development severely diminished the availability of suitable least tern nesting habitat. Loss of nesting habitat in conjunction with increased loss of foraging areas, human disturbance, and predation at remaining breeding colonies resulted in a federal designation of endangered status in 1970 (35 FR

1604). In San Diego County, it is a fairly common summer resident from mid-April to September (Unitt, 2004 and 1984).

During the breeding season which ranges from April through August, the majority of the least tern population is concentrated in Southern California within the counties of Los Angeles, Orange, and San Diego. Over half (60.4 percent in 2008, 4240 pairs) of the U.S. least tern breeding population is located within San Diego County, a large portion of which nests at Camp Pendleton (Marschalek, 2009).

Upon its designation as endangered, California statewide efforts to implement protection for least tern nesting and foraging areas contributed to a breeding population increase from 623 pairs in 1969 to an estimated 7,006 pairs in 2006. Generally, growth has been positive except for 2002 with a one-year loss of over 1,100 breeding pairs, and 2004, with a one-year loss of over 500 pairs (USFWS, 2006a). The statewide population size has grown substantially since 1973 (Marschalek, 2009). Fledgling production has fluctuated more widely with unknown consequences for overall population numbers (Marschalek, 2009).

The number of least terns in the San Diego Bay area has increased in conjunction with the statewide increase (Patton, 2008). After a period of apparent instability during the 1980s, the population has been increasing since 1992. The San Diego Bay-wide breeding numbers experienced a substantial increase from 141 pairs in 1991 to 1,813-2,038 pairs in 2008. San Diego Bay least terns also increased in relative range-wide importance. In 1996, the breeding number of least terns in San Diego Bay was estimated at 436 pairs, or 13 percent of the range-wide population. In 2001, the breeding number of least terns in San Diego Bay was estimated at 871-873 pairs, or approximately 18-19 percent of the statewide population, and in 2006 it was estimated at 1,611-1,638 pairs, or approximately 22-23 percent of the statewide population. Recently, least terns have nested at seven to nine locations around San Diego Bay. These are North Delta Beach, South Delta Beach, Naval Amphibious Base (NAB) ocean beaches, Naval Air Station North Island (NASNI), as well as Lindbergh Field, the South Bay National Wildlife Refuge (formerly Western Saltworks), Chula Vista Wildlife Reserve, D Street Fill/Sweetwater Marsh, and Silver Strand State Beach (a single record of a pair in 2004). Figure 6 presents these least tern nesting areas in relationship to the Shipyard Sediment Site and Potential Staging Areas.

In 2008, the SDUPD monitored and managed the least tern colony at the "D Street Fill" adjacent to San Diego Bay and the mouth of the Sweetwater River on the eastern shoreline. The "D Street Fill" is located approximately three nautical miles south of the

Shipyard Sediment Site. At least 41 nests were established at D Street in 1997, but there were significant losses to predation, and only seven nests were established in 1998 (Patton, 1998a and 1998b). Nest numbers increased to 36 in 1999, but remained relatively low through 2002 when 24 nests were initiated (Patton, 1999; 2000; 2001; 2002). Numbers then increased with 91 nests in 2003, 111 in 2004, 101 in 2005, 100 in 2006, and 130 in 2007 (Patton, 2003; 2004; 2005; 2006; 2007).

As part of the monitoring program, least terns were observed from April 9 through August 29, 2008 at and adjacent to properties and facilities of the SDUPD. At the three Port District and San Diego County Regional Airport Authority sites, 320 nests were established from May 10 to July 18, 2008. At least 134 to 154 young are estimated to have fledged from San Diego International Airport - Lindbergh Field, D Street Fill, and Chula Vista Wildlife Reserve. The 2008 season's numbers of breeding pairs, nests, and fledglings at these three sites were the highest recorded since 2003 (Patton, 2008). The combined estimated number of fledglings produced per pair at the three sites was among the highest recorded that season in San Diego County (Patton, 2008).

The Recovery Plan (USFWS, Revised 27 Sept 1985) identified the population size, distribution, secure nesting site numbers, and reproductive rates necessary for recovery of the California least tern. The Recovery Plan states that for delisting, the terns must have an annual rangewide breeding population of at least 1,200 pairs. This goal has been far surpassed; breeding pairs throughout the range are currently estimated at over 7,000. In 2008, the following were statewide statistics: 2,254- 2,573 fledglings; 0.29-0.37 fledgling/pair; 8223-8226 nests, 6998-7698 pairs; 31 data sites at 56 locations. In 2006, the USFWS initiated a five-year review which has resulted in a recommendation to delist the species to Threatened under the ESA. Without continued intensive management of least tern sites, the USFWS anticipates that the threats of habitat loss and predation would reverse the population recovery that has been seen since the species was listed. Current recommendations for future actions include revisiting and revising management goals and recovery criteria. The USFWS recognizes that the management goals and recovery criteria identified in the 1985 Recovery Plan are outdated and that the plan needs to be revised (USFWS, 2006b).

While the California least tern may occur at the Shipyard Sediment Site or Potential Staging Areas 1 through 4 during construction activities during its breeding season, it is expected to avoid these areas due to its high mobility and capability to access other areas of the Bay for feeding and foraging. The Potential Staging Area 5 located at the 24th Street Marine Terminal and adjacent parking lots is located just north of the D

Street Fill nesting location (Figure 6). While this location is close in proximity to the D Street Fill nesting location, this area is predominantly paved, highly industrial, and offers no habitat for nesting/breeding. In the event that offloading of sediment and dewatering activities occur at this staging area, it is recommended that these activities take place outside of the breeding season to mitigate for potential significant impacts to the least tern. However, if offloading of sediment and dewatering activities were to occur at this staging area during the breeding season, a biological monitor is recommended to mitigate for potential significant impacts

The Shipyard Sediment Site and Potential Staging Areas are not conducive for nesting or breeding due their lack of intertidal beach habitat and existing bulkheads and seawalls that extends the entire length of each site.

Double-crested Cormorant (*Phalacrocorax auritus*). Double-crested cormorants live in both fresh and saltwater environments. Double-crested cormorants are pursuit feeders and actively dive and pursue prey. Double-crested cormorants forage nearshore in the littoral-benthic zone and in the water column over rocky bottoms. These cormorants are almost exclusively fish-eating (upwards to 99 percent) (Fish and Wildlife Information Exchange, 1996a). Cormorants are opportunistic feeders, and alter their diets in response to fish stocks available at the time. In a given location, they will feed on fish species that are most abundant and more easily captured (USFWS, 1998; Rail and Chapdelaine, 1998). Breeding occurs in coastal areas as well as near inland rivers and lakes. They build stick nests in trees, on cliff edges, or on the ground on suitable islands. Populations declined due to eggshell thinning from DDE contamination and, to some extent, human disturbance at nest sites, but the population is currently considered stable-to-increasing in California. This species is listed on the CDFG Watch List (Appendix A).

While the double-crested cormorant may occur at the Shipyard Sediment Site and Potential Staging Areas during construction activities, it is expected to avoid these sites due to its high mobility and capability to access other areas of the Bay for feeding and foraging. The Shipyard Sediment Site and Potential Staging Areas are not conducive for nesting or breeding due their paved industrial setting.

4.2 Fish

California Grunion (*Leuresthes tenuis*). This fish species is not a formally listed species but is considered sensitive because of its beach spawning activity and potential impacts from beach disturbances such as beach cleaning and beach nourishment. This

species is also an important forage fish for several species that are protected or regulated. It uses the high intertidal sandy beach habitat of many Southern California beaches as spawning habitat. Grunion lay their eggs in the wet beach sands during the highest spring tides between late February or early March to as late as early September (Walker, 1952). Due to the lack of intertidal beach habitat and existing bulkhead and seawall that extends the entire length of the Shipyard Sediment Site, Grunion is not expected to spawn in this area.

Steelhead Trout (*Onchorynchus mykiss*). Steelhead trout is a Federal endangered and California State species of special concern. It is also one of the species listed in the Pacific Salmonid Management Plan. The steelhead trout is an anadromous sea-going rainbow trout that lives approximately two to four years of its life (but this period varies greatly) in the open ocean prior to returning to the stream where it was spawned. It is dependent on small, clear-flowing but not rapid, streams with gravel beds to complete its spawning cycle. The area must also have protective cover and an adequate food source. Steelhead populations are declining because of impacts on habitat such as dams, turbidity, stream temperature, and other habitat incursions. With exception to a small population in San Mateo Creek in northern San Diego County, steelhead appear to have been completely extirpated from nearly all systems in the southern portion of the range of the Distinct Population Segment (DPS) from Malibu Creek to the Mexican border.

As an ESA listed species, critical habitat for the California steelhead trout have been designated in the State of California (http://www.nwr.noaa.gov/Publications/FR-Notices/2005/Index.cfm). Final critical habitat designations have been developed for the following five evolutionarily significant units (ESUs) of steelhead in California: (1) southern California steelhead; (2) south-central California coast steelhead; (3) central California Coast steelhead; (4) Central Valley California steelhead; and (5) northern California steelhead. All five of these ESUs occur well north of San Diego Bay beginning in Malibu Creek (west of Los Angeles). Therefore, steelhead trout are not expected to occur in the Bay.

Tidewater Goby (*Eucyclogobius newberryi*). The tidewater goby is a Federally-listed endangered species that has been extirpated from many Southern California creek mouths. It is currently found in shallow marine areas and lower reaches of streams between San Diego northward to Humboldt County waters where salinity is less than 10 ppt (USFWS, 1998). These fish also prefer sandy bottoms with depths of 20–100 cm, near emergent vegetation beds, since they breed in the open areas and winter over in the vegetation. The tidewater goby may be found in small groups of less than a dozen or

occasionally in large aggregations of hundreds. Young tidewater gobies consume small crustaceans, molluscs, and insect larvae.

The population of Tidewater Goby is depleted due to reduced or eliminated flows in the lower reaches of coastal streams, pollution, and the filling in, channelization, and other physical alterations of their habitats. The population disappeared from about 74 percent of the coastal lagoons from Morro Bay southward to San Diego (USFWS, 1994). Habitat conducive to tidewater gobies, such as shallow and brackish water, is absent from the Shipyard Sediment Site and Potential Staging Areas. Therefore, the tidewater goby is not expected to occur at these sites during construction activities.

California Halibut (*Paralichthys californicus*). Although it does not have a formal special status, the California halibut is considered a sensitive species by resource agencies because of its commercial value and a continued region-wide reduction of its nursery habitat in bays and wetlands. California halibut spawn at sea and its larval stages are planktonic. After several months, larval fish settle to the bottom and migrate into shallow coastal waters. Young-of-the-Year fish (YOTY) prefer shallow waters between about -1.5 feet and -3.5 feet MLLW, whereas juveniles prefer deeper channel bottoms to a maximum depth of approximately -15 feet MLLW. After spending nearly nine months in coastal embayments, juveniles move out into the open coastal environment (Allen, 1996). The species uses inshore waters of bays, harbors, and estuaries as a nursery and foraging habitat. Juvenile to sub-adult halibut are known to occur in San Diego Bay (Pondella et al., 2009a).

Adult California halibut and juveniles are expected to occur at the Shipyard Sediment Site and waterfront Potential Staging Areas due to the deep water habitat. Additionally, YOTY California halibut are expected to occur in shallow, unvegetated nearshore areas at the Shipyard Sediment Site and waterfront Potential Staging Areas.

4.3 Marine Mammals

All marine mammals are protected by the Federal Marine Mammal Protection Act of 1972 (MMPA). The MMPA prohibits the intentional taking, import, or export of marine mammals without a permit. Several of the species that occur within the Southern California Basin are also protected under the Federal ESA of 1973. A species that is listed as threatened or endangered under the ESA is categorized as depleted under the MMPA. Unintentional take of a depleted species is allowed by permit only if the activity is determined to have a negligible impact. Intentional take of a depleted species is only allowed under a scientific research permit.

While several species of cetaceans (whale, dolphin, and porpoise), seals, and sea lion (*Zalophus californianus*) occur in Southern California waters, only the bottlenose dolphin (*Tursiops truncatus*), harbor seal (*Phoca vitulina*), and California sea lion (*Zalophus californianus*) use San Diego Bay on a regular basis (Tierra Data, Inc., 2002).

Bottlenose dolphins are often found in shallow inland and coastal waters and live on a diet of approximately 6-7 kilograms (12-15 pounds) of shrimp, squid, eels, and small fish a day. Bottlenose dolphins are known to breed throughout the year.

There are approximately 40,000 harbor seals in California waters. They can usually be observed inhabiting shallow areas where sandbars, rocks and beaches are uncovered during low tides or are otherwise easily accessible. Since harbor seals do not migrate, in many areas they are present year-round and while site fidelity is displayed, harbor seals are also capable of long-distance movements. Some short movements may be associated with seasonal availability of prey and with breeding. Harbor seals are opportunistic feeders, primarily consuming bottom dwelling and schooling prey. Common prey species include herring, flounder, and perch. They will also consume octopus, squid, and shrimp. Breeding generally occurs between February and June.

California sea lions stay no more than 10 miles out to sea. On warm days, they stay close to the water's edge. At night or on cool days, the sea lions will move inland or up coastal slopes. California sea lions prefer to breed on sandy beaches and breed from May to June. Outside of the breeding season, they will often gather at marinas and wharves. California sea lions feed on a wide variety of seafood, mainly squid and fish, and sometimes even clams. Commonly eaten fish and squid species include salmon, hake, Pacific whiting, anchovies, herring, schooling fish, rock fish, lampreys, dog fish, and market squid. They feed mostly around the edge of the continental shelf sea mounts, the open ocean and the ocean bottom.

On the basis of their prey preference, the harbor seal and California sea lion are more likely to feed in the vicinity of Shipyard Sediment Site than the bottlenose dolphin. However, it is assumed that all three species could occur at the Shipyard Sediment Site during construction activities.

4.4 Marine Reptiles

Of the four sea turtles in the family Cheloniidae (green, loggerhead, Pacific ridley, and hawksbill), only the green sea turtle (*Chelonia mydas*), is known to reside in San Diego Bay (Stebbins, 1985). The number of green sea turtles using the bay is dynamic but has been estimated to range between 30 and 60 mature and immature animals (Stinson, 1984; Dutton and McDonald, 1990a, 1990b, 1992; McDonald et al., 1995; Tierra Data, Inc., 2002; Eguchi et al., 2010). Based on the preliminary findings of a sea turtle tagging and hydrophone tracking Joint Research Program being conducted by the Navy, the SDUPD and NOAA, the current number of sea turtles using San Diego Bay is estimated to be greater than 60. Eguchi et al. (2010) documented an annual abundance of green sea turtles in the Bay over a 19 year period ranging from 16 to 61. This is considered the only area on the western coast of the United States where this species congregates (Stinson, 1984; Dutton and McDonald, 1990a and b; San Diego Bay Interagency Water Quality Panel, 1998), and it has been hypothesized that these turtles continue to recruit from breeding sites in Mexico and Ecuador (McDonald and Dutton, 1993; Dutton et al., 1994). According to the Endangered Species Act, this species is listed as threatened wherever found, except breeding colony populations that are listed as endangered in Florida and along the Pacific coast of Mexico. As the San Diego Bay population is considered a part of the Mexican breeding population, it is considered endangered. The NMFS is the lead agency for the turtle recovery in the San Diego Bay region (Tierra Data, Inc., 2002). The NMFS and USFWS have issued a recovery plan for the green sea turtle (NMFS and USFWS, 1998).

Although few data exist regarding the spatial and temporal population distribution, movements and preferred habitat of sea turtles in San Diego Bay, it has been documented that the green sea turtle resided primarily in the southern portion of the Bay in an area where warm water effluent was discharged from the former San Diego Gas and Electric power plant (operations ceased in late 2010), and spends most of its time resting on the bottoms of the main channels (Stinson, 1984; McDonald and Dutton, 1992). Although the turtles' preferred location is likely the effluent channel of the former San Diego Gas and Electric power plant, they have historically been observed as far north as the San Diego - Coronado Bridge (Coronado Bridge) near NAB Coronado (McDonald and Dutton, 1995). The Shipyard Sediment Site and Potential Staging Areas 1 through 4 are located southeast of the Coronado Bridge. Potential Staging Area 5 is located approximately 2.5 nautical miles south of the Shipyard Sediment Site and Potential Staging Areas 1 through 4 in the central portion of the Bay.

Potential habitat for Pacific green sea turtles within San Diego Bay may be utilized during foraging, but are not considered suitable for nesting. Foraging by Pacific green sea turtles is concentrated to eelgrass beds and to lesser extent invertebrate communities in South and South Central bay, considering the concentration of the majority of habitat within those areas. Movement patterns of green turtles in the Bay tagged with temperature sensors indicated a strong diel pattern during winter months (Lyons, 2006). These turtles in the Bay were found to forage outside of the warm effluent plume at night and return to the effluent channel in the morning. Because little is known about foraging patterns of resident Pacific green sea turtles within San Diego Bay, and the majority of sightings have been concentrated in the former San Diego Gas and Electric power plant channel, inferences about movement patterns remain conjecture. Based on the recent closure of the power plant, effectively removing the warm water effluent, it is unknown as to how the green sea turtles will react to this change in habitat conditions.

To address information gaps and uncertainties regarding the spatial and temporal population distribution, movements and preferred habitat of sea turtles in San Diego Bay, the Joint Research Program is in the process of tagging and tracking turtles using an array of deployed hydrophones, including an array of 16 hydrophones in the vicinity of NAB Coronado. It is hoped that through these efforts, detailed information about the movement and feeding of East Pacific green sea turtles in the Bay will be determined in order to better manage their population. It is the parties' desire to develop an appropriate management strategy that will allow for continued use of the Bay as an important commercial and national defense asset, as well as allow for the continued healthy existence of the Pacific green sea turtle in San Diego Bay waters.

5. INVASIVE SPECIES

Aquatic invasive species disrupt the balance of natural ecosystems by consuming or competing with native plants and animals, altering biogeochemical cycles, and reducing native biodiversity. Invasive marine species have arrived in the Bay from all over the world through direct and indirect means, and for intentional and unintentional purposes. In Southern California, one main invasive species is a tropical seaweed (*Caulerpa taxifolia*). Native to the Indian ocean and believed to be an accidental introduction of the aquarium trade into southern California coastal waters, the alga produces a large amount of a single chemical that is toxic to fish and other would-be predators.

While outbreaks have been contained for *Caulerpa taxifolia*, the Water Resources Board, through the NMFS and the CDFG, require that projects that have potential to spread this species through dredging and bottom-disturbing activities conduct pre-construction surveys to determine if this species is present using standard agency-approved protocols conducted by NMFS/CDFG Certified Field Surveyors (NMFS, 2008).

In September 2010, *Caulerpa* surveys were performed to support the BAE Systems Dry Dock Sump Maintenance Dredging Project, Mooring Dolphin Fender Pile Replacement Project, and Pier No. 3 Fender Pile Installation Project. No *Caulerpa* algae were observed during the remote video surveys within the project area (Merkel & Associates, 2010).

Caulerpa surveys have been performed within the NASSCO leasehold in 2002-2004 and 2006 (Coastal Resources Management, 2002; 2003; 2004; 2006). These surveys were performed to support replacement of H-Piles on Berth VI, fender piles on Berths III and IV, jetting and pile driving at Berth VI, and the expansion of Building Ways 3 and 4 submerged groundways. No *Caulerpa* algae were observed during any of the diver transect surveys within the project areas.

It is assumed that no *Caulerpa* algae are currently present at the site based on previous surveys within the Shipyard Sediment Site. However, *Caulerpa* algae surveys will be conducted prior to construction activities to comply with permit applications for Corps Section 404 CWA and Section 10 of the Rivers and Harbors Act, and with the requirements of Section 305(b)(2) of the MSA.

6. IMPACT ASSESSMENT AND MITIGATION MEASURES

The proposed project is the dredging of sediment at the Shipyard Sediment Site, the dewatering and possible solidification of the dredged material on-shore, potential treatment of decanted water, and the transport of the removed material to an appropriate disposal facility. Additionally, portions of the remedial areas (2.4 acres) are located under piers and cannot be feasibly dredged without potential significant impacts to infrastructure. The removal of sediments could compromise the structural stability of the piers, wharves, or bulkheads by damaging and/or weakening pilings and/or fenders. Additionally, it is difficult to remove contaminated sediments under piers with a clamshell bucket due to access constraints. Therefore, it is assumed that a sand layer cover will be spread evenly in these under pier areas identified as containing contaminated sediments.

The Shipyard Sediment Site project area is similar to other industrialized areas within San Diego Bay with regard to distribution of habitats, biological features, and sediment characteristics. This section focuses on stressors associated with the proposed project and the potential impact to EFH (i.e., water column, subtidal [vegetated and non-vegetated] habitat) within the project area. Pursuant to 50 CFR 600.910(a), an adverse effect on EFH is defined as "any impact that reduces the quality and/or quantity of EFH." Factors that were considered in the analysis included the duration, frequency, intensity, and spatial extent of the impact; the sensitivity/vulnerability of the habitat; the habitat functions that might be altered by the impact; and the timing of the impact relative to when the species or life stages may use or need the habitat. Mitigation measures are also presented to reduce potential adverse impacts to marine resources, sensitive species, and rare and endangered species.

In late 2010/early 2011 BAE Systems performed the Dry Dock Sump Maintenance Dredging Project (BAE Systems, 2010). The purpose of the maintenance dredging project was to remove sediments that have deposited in the sump and are preventing the dry dock from achieving full submergence. This maintenance dredging project returned the dry dock sump to its original design depth of -70 ft MLLW by removing approximately 7,000 cubic yards of sediments from the sump floor and the lower part of the slopes. Mitigation efforts implemented to reduce impacts to marine biological resources during this project are discussed and referenced in the following sections.

6.1 Discretionary Permits, Approvals, or Actions

In accordance with Sections 15050 and 15367 of the State CEQA Guidelines, the San Diego Water Board is the designated Lead Agency for the project and has principal authority and jurisdiction for CEQA actions. Responsible Agencies are those agencies that have jurisdiction or authority over one or more aspects associated with the development of a proposed project. Trustee Agencies are State agencies that have jurisdiction by law over natural resources affected by a proposed project that are held in trust for the people of the State.

Project implementation, as it pertains to the marine biological resources, will require approval of a Coastal Development Permit by the Port District, pursuant to the California Coastal Act, and administrative (ministerial) approvals from Responsible and Trustee Agencies, including but not limited to the San Diego Water Board, pursuant to CWA and the California Water Code Porter-Cologne Act; the ACOE, pursuant to Section 404 of the CWA and Section 10 of the Federal Rivers and Harbors Appropriation Act of 1899 (CDFG will review and comment on ACOE permits pursuant to the Federal Fish and Wildlife Coordination Act); NMFS, pursuant to the MSA; the USFWS, pursuant to the ESA; and the California State Lands Commission.

6.2 Sediment and Water Quality

The purpose of the project is to implement a Tentative CAO issued by the San Diego Water Board for the cleanup of contaminated marine sediments. Cleanup efforts will include removal of contaminated sediments by dredging. The dredging will occur in an area of the Bay defined in the Tentative CAO. Sediment and water quality effects on marine biological resources from dredging would include temporary and localized increases in turbidity. Turbidity may also increase if vessel propellers impact the Bay floor or prop wash stirs up bottom sediments.

Dredging activities will also have a potential to release detectable levels of sediment-bound contaminants into the water column that could be redistributed through the tidally-induced movement of the turbidity plume. Organically enriched sediments resuspended into the water column during dredging will also cause a slight decrease in dissolved oxygen (DO) levels. Tidal currents will slowly dissipate the oxygen-poor water mass and replenish ambient oxygen levels within one-to-several tidal exchanges. To prevent the spread of any turbidity plume or release of sediment-bound contaminants out of the area, Best Management Practices (BMPs) should be implemented to reduce potential adverse impacts to marine resources, sensitive species, and rare and

endangered species. BMPs include use of an environmental dredge bucket, installation of silt curtains, operational controls, and water quality monitoring. These BMPs are discussed below and in the Hazards and Hazardous Waste and Water Quality Technical Reports for this project.

Accidental oil or fuel spills that could potentially occur during the proposed dredging operations could result in significant effects on water quality, and subsequently the fish and wildlife of the Bay, depending on the severity of the spill. Such events are likely to be localized spills of lighter, refined diesel fuels, gasoline, and lubricating oils that are highly toxic to marine life. The potential for the occurrence of petroleum-product leaks or spills would be low, but the potential for significant, long-term effect on marine resources would be moderate to high. The inclusion and implementation of a Dredging Management Plan (DMP) for the project will assist in preventing accidental spills and providing the necessary guidelines to follow in case of an oil or fuel spill, and reduce the potential for a significant long-term impact to biological marine resources to less than significant.

Mitigation Measures. Turbidity caused by dredging will be minimized by using an environmental bucket such as the Cable Arm Environmental Clamshell®. The Cable Arm Environmental Clamshell® is equipped with vertical side plates that reduce sediment loss during bucket closing, flatter sediment cut reducing the potential for sediment resuspension caused by potholes, and indicator switches at the four corners (i.e., left, right, top, bottom) of the clamshell seal. The switches are positioned in these locations to inform the operator if and where the bucket is failing to close. The dredge operators will use automatic rather than manual monitoring of the dredging operations, which will allow continuous data logging with automatic interpretation and adjustments to the dredging operations for real-time feedback for the dredge operator. Automatic systems will also be used to monitor turbidity and other water quality conditions in the vicinity of the dredging operations to facilitate real-time adjustments by the dredging operators to control temporary water quality effects.

Dredging operations will be configured to limit the turbidity caused by the actual sediment removal. Double silt curtains, deployed by the dredge contractor, will be utilized for containment of the dredge area; configurations and technologies will be finalized during the design phase of the project. A silt curtain containment within a floating “dredge cell” that is lined with a silt curtain on the inside of the cell is shown in Figure 7. A modification of this type of configuration would be to install the silt curtain around the outside of the dredge cell. This type of containment was implemented during

the BAE Systems Dry Dock Sump Maintenance Dredging Project executed in late 2010/early 2011 (BAE Systems, 2010).

The preferred containment configuration that covers a large area within a double silt curtain is shown in Figure 8. This combination of silt curtain containment systems includes an outer curtain defining the dredging area and an inner curtain around the dredge to be used, to further minimize turbidity. This deployment was also used by BAE Systems during the Dry Dock Sump Maintenance Dredging Project executed in late 2010/early 2011 (BAE Systems, 2010). The disadvantage to this configuration is that the silt curtain gate must be opened and closed by project personnel, which poses safety concerns, and also increases the potential for turbidity and/or suspended contaminant dispersal outside the silt curtain. To mitigate for this potential impact, the curtain gate should only be opened when the clamshell bucket is not in operation.

The floating silt curtain will be Type III comprised of connected lengths of geotextile fabric. It is intended to supplement the operational controls described above by helping to control and contain migration of (contaminated) suspended sediments at the water surface and at depth. This in turn will help protect surrounding submerged areas from accumulation of resuspended solids originating from the dredging work.

A continuous length of floating silt curtain will be arranged to fully enclose the dredging equipment and the scow barge being loaded with sediment. The silt curtain will be supported by a floating boom in open water areas (such as along the bayward side of the dredging areas). Along pier edges, the dredge contractor will have the option of connecting the silt curtain directly to the structure. In either case, the contractor would be required to continuously monitor the silt curtain for damage, dislocation, or gaps, and immediately fix any locations where it is no longer continuous or where it has loosened from its supports.

The bottom of the silt curtain shall be weighted with ballast weights or rods affixed to the base of the fabric. These weights are intended to resist the natural buoyancy of the geotextile fabric and lessen its tendency to move in response to currents. Extending the silt curtain further or all the way to the bay floor would be problematic and potentially counter-productive. This is because at lower tides the geotextile fabric would be in contact with sediments at the mudline, potentially folding up on the seabed; and when subsequently moved by current flow or lifted by rising tide it would cause increased sediment disturbance, generating an additional source of sediment resuspension and turbidity. Therefore, the floating silt curtain around the dredging unit will be deployed in a manner that includes a gap above the seafloor to allow for the tidal ranges and

fluctuations, and to sufficiently allow for dredge operation. The outer silt curtain surrounding the remediation site shall be deployed in a manner dependent on site-specific conditions including, but not limited to, depth, current velocities, existing infrastructure for curtain deployment, and proximity of sensitive habitat (i.e., essential fish habitat).[1]

Where feasible and applicable, curtains will be anchored and deployed from the surface of the water to just above the substrate. If necessary, silt curtains with tidal flaps will be installed to facilitate curtain deployment in areas of higher flow. Additional curtains may be required by resource agencies to isolate environmentally sensitive areas like essential fish habitat and eelgrass.

Air curtains may be used in conjunction with silt curtains to contain resuspended sediment, to enhance worker safety, and allow barges to transit into and out of the work area without the need to open and close silt curtain gates. Air curtains are formed by laying a perforated pipe along the mudline and pumping air continuously through the piping. The upwelling of the tiny bubbles to the surface of the water has the effect of preventing fine-grained sediments from passing across the line of the pipe.

In addition to the deployment of silt curtains, another supplemental protective measure to reduce impacts to water quality is physical monitoring. The Tentative CAO requires monitoring during remedial activities. Post-remediation monitoring is also required to verify that remaining pollutant concentrations in the sediments will not unreasonably affect beneficial uses in San Diego Bay. The post-remediation monitoring requirements are part of the proposed project and are not mitigation for the remediation efforts. The Tentative CAO requires that, prior to beginning remediation efforts, a Monitoring and Reporting Plan (MRP) will be required to describe the remediation and monitoring activities. The MRP will describe the following, consistent with the Tentative CAO:

- Water quality monitoring to demonstrate that implementation of the selected remedial activities does not result in violations of water quality standards outside of the remedial area.
- Sediment monitoring to confirm that the selected remedial activities have achieved target cleanup levels within the remedial footprint.

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[1] United States Army Corps of Engineers: Engineer Research and Development Center. 2008. Technical Guidelines for Environmental Dredging of Contaminated Sediments. ERDC/EL TR-08-29.

Water quality compliance will be predicated upon the Water Quality Control Plan for the San Diego Basin (i.e., the Basin Plan) turbidity objectives (Chapter 3, page 30) and DO objectives (Chapter 3, page 22), and will have specific compliance criteria based on comparisons with ambient conditions within San Diego Bay. This is consistent with the water quality objectives implemented during the 2010/2011 BAE Systems Dry Dock Sump Maintenance Dredging Project.

The water quality monitoring will evaluate turbidity levels (measured in Nephelometric Turbidity Units [NTUs]) and DO levels to demonstrate that remedy implementation does not result in violations of water quality standards outside the construction area.

Daily visual monitoring will be conducted during construction activities (dredging and sand covering). A detailed worksheet describing both the visual turbidity plume as well as documenting all conditions and any additional debris encountered during the observational period will be reported on a daily basis. Photographs of operational elements of the dredging will also be taken to visually document conditions. All observer reports will be included in the Final Cleanup and Abatement Report.

During active dredging activities, the trained observer will conduct daily qualitative (visual) turbidity monitoring from a high vantage point to ensure water quality objectives for turbidity are not observed outside the silt curtains. If turbidity limits are exceeded, the observer has the authority to halt dredging activities to allow for additional BMPs to be implemented for turbidity containment. Following implementation of additional BMPs, visual turbidity monitoring will resume to ensure the effectiveness of the additional BMPs.

Project mitigation measures, such as operational controls, to reduce potential adverse impacts to marine resources, sensitive species, recreational and commercially important species, and rare and endangered species are provided below.

- No construction materials, equipment, debris, or waste that could increase turbidity and/or release potential contaminants shall be placed or stored where it may be subject to tidal erosion and dispersion to the Bay.
- All trash shall be disposed of in the proper trash receptacles on an ongoing basis throughout the project by contracted and shipyard personnel.
- Silt curtains, configured in similar fashion as deployed during the 2010/2011 BAE Systems Dry Dock Sump Maintenance Dredging Project (BAE Systems,

2010), shall be utilized to control turbidity and release of sediment-bound contaminants.

- The shipyards shall limit, to the greatest extent possible, the suspension of sediments into the water column outside the project area/silt curtains. This is accomplished by implementing the BMPs discussed above.
- Silt curtains will not be removed from the completed dredge area until turbidity has been reduced to ambient conditions. Water quality monitoring will be performed to measure for ambient conditions. Ambient conditions will be defined in the MRP discussed above.
- Construction methods shall be used that are the least damaging to sediments and benthic organisms. This is accomplished by implementing the BMPs discussed above.

The inclusion and implementation of a DMP containing Standard Operating Procedures (SOPs) for the project will assist in preventing accidental spills and provide the necessary guidelines to follow in case of an oil or fuel spill, such that the potential for a significant long-term impact is reduced to less than significant. The DMP will include the following measures to prevent accident oil/fuel spills during construction activities:

- Personnel involved with dredging and handling the dredged material will be given training on the potential hazards resulting from accidental oil and/or fuel spills. This operational control will provide the personnel with an awareness of the materials they are handling as well as the potential impact to the environment. This increased awareness will assist in minimizing impacts to the water column as a result of spills.

- All equipment will be inspected by dredge contractor personnel before starting the shift. These inspections are intended to identify typical wear or faulty parts that may contain oil or fuel. This operational control will minimize the potential of impacts during the operations by identifying potential impacts due to wear of important sub-systems.

- Personnel will be required to visually monitor for oil or fuel spills during construction activities. This operational control will minimize impacts associated with leaks or spills and will provide additional mitigation over the automatic systems identified above.

- In the event that a sheen or spill is observed, the equipment will be immediately shut down and the source of the spill identified and contained. Additionally, the spill will be reported to the applicable agencies presented in the DMP. This operational control will minimize impacts to the water quality both in volume and duration as the operations will be immediately shut down and the source of the impact will be identified and remedied.

- The shipyards currently have oil/fuel spill kits located at various locations onsite for routine ship repair operations. All personnel associated with dredging activities will be trained on where these spill kits are located, how to deploy the oil sorbent pads, and proper disposal guidelines. As an additional mitigation step, the dredging barge shall have a full complement of oil/fuel spill kits on board to allow for quick and timely implementation of spill containment.

- The use of oil booms will be deployed surrounding the dredging activities. In the event that a spill occurs, the oil and/or fuel will be contained within the oil boom boundary. This operational control will be the last line of defense against accidental oil/fuel spill occurrences. The oil boom shall be deployed along the entire length of the outer silt curtain.

6.3 Water Column Biota

As discussed above in Section 6.2, an increase in turbidity is anticipated during dredging and sand covering activities, which will result in a temporary reduction in submarine light levels, resulting in a short-term reduction of plankton productivity within the project area. Because plankton drift with the currents and turbidity is expected to be localized, there will be only short-term, less-than-significant impacts to the plankton community.

There is no mortality anticipated of open water schooling fishes (atheriniids or anchovies) or fishes associated with piling habitats (i.e., black surfperch, pile perch, kelpfish, and pipefish). Water column and bottom dwelling fishes (such as halibut and gobies) are expected to swim away from the immediate work area during active deployment of the silt curtain. It is uncertain if any water column biota will become entrapped within the silt curtain after deployment. Silt curtains will act as a mitigation measure to contain turbidity within the project area created during dredging activities. Regardless of which of the two scheduling options proposed for dredging is implemented, phasing of the dredging activities during 2 to 2.5 years or a continuous

dredging cycle over a 12.5 month period, fish will be able to find sources of food on nearby hard substrata outside of the project area.

Mitigation Measures. The Shipyard Sediment Site water column habitat supports a plankton and fish community of species that are common to bays and harbors of Southern California. Living in bays and harbors, with constant sources of turbidity from stormwater runoff, recreational boat and large vessel operations, this community of marine organisms has acclimated, to some degree, to turbid conditions that might arise from site-specific ship repair operations. It is anticipated that most demersal and pelagic species would avoid the dredging area and that potential impacts would be minor resulting in the displacement of, followed by post-construction re-colonization by, these species.

The use of BMPs such as operational controls, silt curtains and water quality monitoring, as described above in Section 6.2, will minimize the extent of the turbidity plume and resuspension of sediments outside of the project area.

6.4 Soft-Bottom Benthic and Hardscape Associated Communities

Dredging and sand covering will result in the temporary loss (mortality) of the majority of benthic infauna within the dredge/sand covering footprints (approximately 759,790 sq ft). It is assumed that a portion of the mobile benthic invertebrate community found in the Shipyard Sediment Site may relocate during dredging/sand covering activities and avoid mortality. This will have a significant, but short-term localized impact on the benthic community. No loss of benthic infauna is expected at the Potential Staging Areas as no sediment removal will occur and in-work activities in these staging areas are limited to the offloading of dredged material from a floating material barge to land.

There will be no long-term reductions in the amount of benthic soft bottom habitat or populations of benthic invertebrates within the Shipyard Sediment Site as a consequence of dredging/sand covering. The area is typical of other bay environments in Southern California and is dominated by species adapted to constant environmental stresses. Following the completion of dredging/sand covering, benthic invertebrates will begin the recolonization process.

Post-Remediation Monitoring. As per the Tentative CAO, post-remediation monitoring will be initiated two years after remedy implementation has been completed and potentially continue for a period of up to 10 years after remediation. The post-remediation monitoring requirements are part of the proposed project and are not

mitigation for the remediation efforts. As per the Tentative CAO, the frequency of sediment sampling and analyses (chemical, physical, and bioaccumulation) will occur at two and five years post-remediation and, depending on the results at year five post-remediation, may also occur at ten years post-remediation. Therefore, in compliance with the Tentative CAO, a Post-Remedial Monitoring Plan (PRMP) will be required as part of the proposed project to verify that remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses.

For aquatic life beneficial uses in the Bay, post-remediation monitoring will include sediment chemistry and toxicity bioassays to verify that post-remedial conditions have the potential to support a healthy benthic community (San Diego Water Board, 2010). In addition, post-remediation monitoring will include benthic community condition assessments to evaluate the overall impact of remediation on the benthic community recolonization activities. The purpose of assessing benthic community conditions as part of post-remedy monitoring is to demonstrate the remediation will successfully create conditions that would be expected to promote re-colonization of a healthy benthic community.

6.5 Sensitive Species

California Least Tern. Construction activities may disturb the California least tern, if present during dredging activities. If construction activities are performed during the scheduling option that includes approximately seven month dredging episodes extending over 2 to 2.5 years, potential impacts to the California least tern are likely to be less than significant due to work being performed outside the breeding season. If construction activities are performed during the scheduling option of continuous dredging cycle over a 12.5-month period, potential significant impacts are recognized. However, only small areas of the Shipyard Sediment Site are to be affected at any one time regardless of the dredge schedule, leaving available other open water areas for this species to forage. There is no shallow water foraging habitat at the Shipyard Sediment Site, limiting current feeding opportunities. The least tern may choose to avoid the immediate construction work area based on the lack of foraging habitat and the fact that no known nests have been recorded at the site.

To ensure that any potential impacts remain less than significant, mitigation is proposed requiring a qualified biologist to monitor least terns and other special-status waterbirds at the Shipyard Sediment Site and selected Staging Area(s) immediately prior to and

during the initial start-up phase of construction activities. The biologist will not be required to be onsite throughout the entire dredging process; however, monitoring should be performed once per week to adequately assess potential waterbirds occurring during construction.

In accordance with the ESA Consultation Handbook (USFWS, 1998), informal Section 7 consultation with USFWS and NMFS will be implemented to determine what effect the proposed project will have on the California least tern, explore means to modify the proposed project to reduce or remove adverse effects to the California least tern, determine the need to enter into formal Section 7 consultation, and explore the design or modification of the proposed project plans to benefit the California least tern. Based on the results of the informal consultation with USFWS/NMFS, either concurrence that the project will not adversely affect the California least tern will be received or formal consultation will be required if concurrence is not received.

If formal consultation is requested by USFWS/NMFS, a biological assessment will be required to be submitted documenting the presence of the California least tern near the proposed project area and a description of the effects of the proposed project. USFWS and NMFS will formulate a biological opinion and incidental take statement ending the formal consultation.

Mitigation Measures. The following mitigation measure would specifically reduce impacts to California least terns and other potentially present waterbirds to a less than significant level:

- A qualified biologist will be retained and be on site to assess the roosting (and foraging) behavior of waterbirds at the Shipyard Sediment Site and selected Staging Area(s) immediately prior to and during the initial start-up phase of construction activities. The biologist will not be required to be onsite throughout the entire dredging process; however, monitoring should be performed once per week to adequately assess potential waterbirds occurring during construction. The biologist will be present during either of the selected dredge scheduling options. In the event of an imminent threat to a California least tern and/or special-status species, the monitor shall immediately contact the Dredging Contractor's Construction Manager. In the event the Construction Manager is not available, the monitor shall have the authority to redirect or halt construction activities if determined to be necessary.

Implementation of this Mitigation Measure would reduce impacts to this species to less than significant.

California Brown Pelican. Construction activities may disturb the California brown pelican, if present during such activities. However, construction will disturb small areas of the Shipyard Sediment Site at any one time, leaving available other open water areas for this species. Therefore, because construction is confined to a small area within the Bay, potential impacts to California brown pelicans are considered less than significant. However, to ensure that any potential impacts remain less than significant, mitigation has been proposed (see above for California least tern) requiring a qualified biologist to monitor special-status waterbirds prior to any significant construction activities.

Double-Crested Cormorant. Construction activities may disturb the double-crested cormorant, if present during such activities. However, construction will disturb small areas of the Shipyard Sediment Site at any one time, leaving available other open water areas for this species. Because cormorants are opportunistic feeders and alter their diets in response to fish stocks available at the time, this species is not expected to feed at the dredging site due to the absence of fish from the BMPs implemented. Therefore, because construction is confined to a small area within the Bay and fish stocks will not be available at the site, potential impacts to double-crested cormorants are considered less than significant. However, to ensure that any potential impacts remain less than significant, mitigation has been proposed (see above California least tern) requiring a qualified biologist to monitor special-status waterbirds prior to any significant construction activities.

California Grunion (*Leuresthes tenuis*). Due to the lack of intertidal beach habitat and existing bulkhead and seawall that extends the entire length of the Shipyard Sediment Site, Grunion is not expected to spawn in this area. Therefore, no construction-related impacts will occur on this species or its habitat.

Steelhead Trout. There are no known populations of this species in San Diego Bay; therefore, there will be no construction-related impacts on Steelhead Trout EFH for salmonids.

Tidewater Goby. Tidewater gobies are not known to occur within San Diego Bay; no construction-related impacts will occur to this species or its habitat.

California Halibut. Adult and juvenile halibut are found in many areas of San Diego Bay, and they will potentially be present within the Shipyard Sediment Site and

Potential Staging Areas. During dredging activities, adults/juveniles in the immediate area will swim to areas outside the immediate impacted zone. During offloading activities, adults/juveniles will be able to swim freely under the material barge as this mimics normal vessel docking conditions in the Bay. No mortality is anticipated as a result of construction activities. Therefore, the level of impact on halibut is expected to be less than significant.

6.6 Essential Fish Habitat

Eelgrass. Barges, scows, and support vessels have a potential to impact eelgrass through: (1) deployment of anchors and anchor chain within eelgrass habitat; (2) grounding of the vessels over eelgrass habitat; and (3) propeller scarring and propeller wash. These activities would create furrows and scars within the eelgrass vegetation, and perhaps temporarily increase turbidity that could potentially cause additional adverse losses of eelgrass habitat along the transit corridor in-and-out of the Shipyard Sediment Site and during offloading activities at any of the Potential Staging Area(s).

A long-term reduction of eelgrass within the BAE Systems leasehold and a portion of the NASSCO leasehold is predicted, related to dredging to depths beyond eelgrass depth limits. It is estimated that between 0.5 to 0.8 acres of eelgrass will be impacted during the sediment remediation project. Pre-construction surveys of each Potential Staging Area are not required with the exception of the staging area that lies within the Shipyard Sediment Site (Potential Staging Area 3 - BAE Systems leasehold). Potential Staging Areas 1, 2, and 5 offer dockside offloading of material barges (Potential Staging Area 4 is an upland parking lot and not adjacent to the water). These waterfront areas are deep water port docks and are not conducive habitat for eelgrass growth.

A pre-construction (dredging/sand covering) survey of eelgrass beds along the Shipyard Sediment Site will be conducted to evaluate the amount of eelgrass vegetation that will be impacted. The anticipated loss is a long-term, but mitigable, impact on EFH. Mitigation for these losses will be required per requirements of the Southern California Eelgrass Mitigation Policy (SCEMP) (NMFS, 1991 as amended). Upon successful mitigation for these losses, the level of impact will be reduced to a less than significant impact.

Mitigation Measures. Prior to sediment removal activities, BAE Systems and NASSCO will be required to conduct a robust eelgrass survey in accordance with the SCEMP (NMFS, 1991, revision 11). Each shipyard may choose to conduct their

eelgrass surveys independent of each other. The pre-construction eelgrass surveys of each shipyards remedial area should cover the entire proposed dredging areas as well as a large reference area in the Bay near the Shipyard Sediment Site.

The survey will mark the beginning of formal consultation with NMFS. The goal of the survey will be to provide a quantitative assessment of the eelgrass communities in the vicinity of the project site in conformance with the SCEMP. Based on the Tentative CAO dredge footprint, it is assumed that 100 percent of the eelgrass identified during the pre-dredge survey will be removed and mitigated as per the SCEMP. Impacts to eelgrass from dredging will be mitigated at 1.2 to 1 per NMFS policy.

Eelgrass Mitigation Requirements. As a submerged aquatic habitat, eelgrass is given special status under the Clean Water Act, 1972 Section 404(b)(1), "Guidelines for Specification of Disposal Sites for Dredged or Fill Material", Subpart E, "Potential Impacts on Special Aquatic Sites." Mitigation will be required for the loss of existing vegetated areas, loss of potential eelgrass habitat, and/or degradation of existing/potential eelgrass habitat.

A pre-construction eelgrass habitat mapping survey for the Shipyard Sediment Site will be required to be completed within 120 days of the proposed start dates of each project phase in accordance with the SCEMP (NMFS, 1991 as amended) to amend, if required, the amount of eelgrass that will likely be affected by dredging activity. The results of these surveys will be integrated into a Final Eelgrass Mitigation Plan and used to calculate the amount of eelgrass to be mitigated. The Final Eelgrass Mitigation Plan will include the following elements:

- A detailed map of the area including distribution, density and relationship to depth contours of any eelgrass beds likely to be impacted by project construction.
- Identification of a Mitigation Site(s) - factors such as distance from project, depth, sediment type, distance from ocean connection, water quality, and currents are among those that should be considered in evaluating potential sites.
- Techniques for the construction and planting of the eelgrass mitigation site consistent with the best available technology at the time of the project.
- Proposed mitigation timing schedule.
- Proposed mitigation monitoring activities.

The location of eelgrass transplant mitigation shall be in areas similar to those where the initial impact occurs. Factors such as distance from project, depth, sediment type, distance from ocean connection, water quality, and currents are among those that should be considered in evaluating potential sites. In the case of transplant mitigation activities that occur concurrent to the project that result in damage to the existing eelgrass resource, a ratio of 1.2 to 1 shall apply. That is, for each square meter adversely impacted, 1.2 square meters of new suitable habitat, vegetated with eelgrass, must be created. The rationale for this ratio is based on: 1) the time (i.e., generally three years) necessary for a mitigation site to reach full fishery utilization; and 2) the need to offset any productivity losses during this recovery period within five years.

NMFS, USFWS, and the CDFG require that mitigation be conducted "in kind" (i.e., mitigation of eelgrass), and "on site" (i.e., within the same system - San Diego Bay). If this cannot be achieved, offsite mitigation areas can be evaluated. However, off-site mitigation is extremely difficult to achieve because agencies prefer that mitigation is conducted in the system that was affected by the project impacts.

A post-dredging project eelgrass survey will be completed and submitted within 30 days of the completion of each dredging episode in accordance with the SCEMP (NMFS, 1991 as amended) to the NMFS, USFWS, CDFG and the Executive Director of the CCC. It is likely that all identified eelgrass occurring at the Shipyard Sediment Site is within the Tentative CAO dredge footprint. Therefore, it is assumed that 100 percent of the eelgrass identified during the pre-dredge survey will be removed. Post-dredging eelgrass surveys will be compared to the pre-dredge surveys to assess overall eelgrass impacts. Mitigation will be required at a 1.2:1 ratio for the difference between impacted eelgrass beds based on the pre- and post-dredge survey results. .

Mitigation Success Criteria. Criteria for determination of transplant success shall be based upon a comparison of vegetation coverage (area) and density (turions per square meter) between the project adjusted impact area (i.e., original impact area multiplied by 1.2, or the amount of eelgrass habitat to be successfully mitigated at the end of five years) and mitigation site(s). Extent of vegetated cover is defined as that area where eelgrass is present and where gaps in coverage are less than one meter between individual turion clusters. Density of shoots is defined by the number of turions per area present in representative samples within the original impact area, control or transplant bed.

Specific criteria are as follows:

- The mitigation site shall achieve a minimum of 70 percent area of eelgrass and 30 percent density as compared to the adjusted project impact area after the first year.
- The mitigation site shall achieve a minimum of 85 percent area of eelgrass and 70 percent density as compared to the adjusted project impact area after the second year.
- The mitigation site shall achieve a sustained 100 percent area of eelgrass bed and at least 85 percent density as compared to the adjusted project impact area for the third, fourth and fifth years.

Should the required eelgrass transplant fail to meet any of the established criteria, then a Supplementary Transplant Area (STA) shall be constructed, if necessary, and planted.

The size of this STA shall be determined by the following formula:

$STA = MTA \times ([A_t + D_t] - [A_c + D_c])$

MTA = mitigation transplant area.

A_t = transplant deficiency or excess in area of coverage criterion (%).

D_t = transplant deficiency in density criterion (%).

A_c = natural decline in area of control (%).

D_c = natural decline in density of control (%).

The STA formula shall be applied to actions that result in the degradation of habitat (i.e., either loss of areal extent or reduction in density).

Five conditions apply:

1) For years 2-5, an excess of only up to 30 percent in area of coverage over the stated criterion with a density of at least 60 percent as compared to the project area may be used to offset any deficiencies in the density criterion.
2) Only excesses in area criterion equal to or less than the deficiencies in density shall be entered into the STA formula.
3) Densities which exceed any of the stated criteria shall not be used to offset any deficiencies in area of coverage.

4) Any required STA must be initiated within 120 days following the monitoring event that identifies a deficiency in meeting the success criteria. Any delays beyond 120 days in the implementation of the STA shall be subject to the penalties as described in Section 8 of the SCEMP.

5) Annual monitoring will be required of the STA for five years following the implementation and all performance standards apply to the STA.

Remedial and Contingency Plans for Unsuccessful Eelgrass Mitigation. If the initial transplant is unsuccessful, then one additional replanting at the primary on-site mitigation area will occur. The amount to be transplanted will be based upon the guidelines in the SCEMP (NMFS, 1991 as amended). If remedial transplants at the project site are unsuccessful, then eelgrass mitigation should be pursued at the secondary eelgrass transplant location.

The Mitigation Measure requirements described above in accordance with the SCEMP are proposed to reduce potential impacts to eelgrass marine resources at the Shipyard Sediment Site to a less than significant level. If the implementation of the Mitigation Measures described above are successful, this will reduce impacts related to eelgrass to a less than significant level.

6.7 Marine Reptiles

Sea Turtles. Although green sea turtles are known to be in San Diego Bay, the potential for adverse impacts to an individual during dredging activities is low. Dredging, sand covering, and vessel movements within the project area would potentially result in a behavioral modification to sea turtles that would include a change in swimming behavior to avoid excessive noise, turbidity, or the vessel movements. Additionally, the deployment of silt curtains surrounding the dredging/sand covering activities will act as a preventive barrier for green sea turtles entering the construction area.

Material barges transporting dredged material to potential sediment staging sites within San Diego Bay would be transiting a short distance in which green sea turtle may potentially be encountered. Therefore, there is a potential that green sea turtles may be in the general project barge transit lanes when barge transport activities are occurring. Similar to typical ongoing vessel traffic occurring in San Diego Bay, it is assumed that green sea turtles would change their swimming behavior to avoid vessel movements.

Mitigation Measures. The following mitigation measures would specifically reduce impacts to sea turtles to a less than significant level:

- Because sea turtles could potentially forage within and among eelgrass beds identified at the Shipyard Sediment Site, a project marine biologist shall mark the positions of eelgrass beds with buoys prior to the initiation of any construction to minimize damage to eelgrass beds outside the construction zone.
- The project marine biologist shall meet with the construction crews prior to dredging and periodically throughout the project to review pre-dredge survey areas of eelgrass beds to avoid located adjacent to the Shipyard Sediment Site and to review proper construction techniques.
- Barges and work vessels operated outside the project area in areas where eelgrass beds exist shall be operated in a manner throughout the entire project to ensure that they are not impacted through grounding, propeller damage, or other activities that may disturb the sea floor. Such measures shall include speed restrictions, establishment of off-limit areas, and use of shallow draft vessels.
- Barges and work vessels shall be operated in a manner throughout the entire project to ensure that sea turtles are not impacted through excessive vessel speed or propeller damage. Such measures shall include speed restrictions, establishment of off-limit areas, and use of shallow draft vessels.
- Construction crews and work vessel crews shall be briefed daily on the potential for this species to be present and provided with identification characteristics of sea turtles, since they may occasionally be mistaken for seals or sea lions.
- All construction activity shall be temporarily stopped if a sea turtle is sighted within 100 meters of the construction zone until the sea turtle is safely outside the outer perimeter of construction. The on-site biological monitor, who will be onsite periodically during dredging activities, shall have the authority to halt construction operation and shall determine when construction operations can proceed.
- The biological monitor shall prepare an incident report of any green sea turtle activity in the project area and shall inform the Construction Manager to have his/her crews be aware of the potential for additional sightings. The report shall be provided within 24 hours to the CDFG and NMFS.
- Use of silt curtains throughout the entire project will act as a preventive barrier to reduce sea turtle exposure to dredging activities.

6.8 Fisheries Management Plan

Project activities that would affect identified Coastal Pelagic FMP species (northern anchovy) include increased water turbidity caused by dredging and sand covering activities proposed for the project. These impacts could result in northern anchovy temporarily avoiding the project areas, and a minimal potential for mortality of larval anchovy. An increase in the suspended sediment load would temporarily increase the exposure of these species to potentially toxic levels of contaminants and clog their gills, resulting in a reduced ability to feed.

Mitigation Measures. Of the 83 species managed under the Pacific Groundfish FMP (NMFS, 2008), two have been found in San Diego Bay, each with very low occurrences. In the event that Pacific Groundfish species are present in San Diego Bay during dredging activities, the deployment of the silt curtains will act as a preventive barrier for any groundfish entering the construction area. The impact of turbidity created during dredging activities will be short-term and localized. Therefore, the potential impact of the project on FMP groundfish species is expected to be less than significant.

To address impacts to FMP species and water quality, the use of an environmental clamshell bucket for the dredging activities will be implemented to reduce turbidity within the dredge footprint. Additionally, the deployment of silt curtains surrounding the dredging/sand covering activities will act as a preventive barrier for any Coastal Pelagic FMP species entering the construction area.

As mentioned above, the use of silt curtains will act as a preventive barrier for any FMP pelagic schooling species entering the construction area. Therefore, potential impacts on Coastal Pelagic FMP species or their EFH are expected to be less than significant.

6.9 Marine Mammals

Construction activities may disturb marine mammals, if present during such activities. Dredging operations could disturb sediments containing sediment-bound contaminants that are potentially harmful to marine mammals. Exposure to these contaminants that could cause acute toxicity or bioaccumulation to marine mammals and sea birds would be avoided by implementation of standard conditions of the Corps permits requiring Section 401 water quality certification by the San Diego Water Board. The appropriate dredging permits require that dredging BMPs are incorporated into the project to ensure that impacts related to the effects of turbidity and dissolved concentrations of some contaminants are temporary and less than significant. Implementation of these measures

will ensure that any impacts to marine mammals related to contamination effects from dredging would be less than significant. No additional mitigation is required.

Barges transiting dredge material to and from the Shipyard Sediment Site have a low potential to collide with marine mammals. Marine mammals are generally capable of avoiding boat traffic (Richardson et al., 1983), particularly at the speeds at which the vessels will likely be transiting. Marine mammals in the Bay have also likely habituated to vessel traffic since vessels commonly transit within and in-and-out of the Bay.

Mitigation Measures. As discussed above in Section 6.5, to ensure that any potential impacts remain less than significant, mitigation has been proposed requiring a qualified biologist to monitor special-status waterbirds prior to and periodically during construction activities. The biologist will also monitor for marine mammals potentially present at the site.

The following mitigation measures would specifically reduce impacts to marine mammals to a less than significant level:

- Barges and work vessels shall be operated throughout the entire project in a manner to ensure that marine mammals are not impacted through excessive vessel speed or propeller damage. Such measures shall include speed restrictions, establishment of off-limit areas, and use of shallow draft vessels.
- Vessel operators will be required to be trained prior to the start of the project to recognize the presence of marine mammals.
- Construction crews and work vessel crews shall be briefed daily at safety meetings on the potential for marine mammals to be present.
- All construction activity shall be temporarily stopped if a marine mammal is sighted within 100 meters of the construction zone until the marine mammal is safely outside the outer perimeter of construction. The on-site biological monitor shall have the authority to halt construction operation and shall determine when construction operations can proceed.
- Use of silt curtains will act as a preventive barrier to reduce marine mammal exposure to dredging activities.
- In the event a pinniped or cetacean is injured or killed as consequence of a collision, the impact would be a locally significant impact, but it would not result in a population-level impact. Should this occur, the vessel operator and the

appointed shipyard safety personnel will be required to immediately notify the NMFS (Southwest Division) and will submit a written, follow-up report within 24 hours of the incident.

6.10 Noise Production from Dredging

Sound travels through the air as pressure waves caused by some type of vibration. In general, sound waves travel away from a noise source at ground level in a hemispherical pattern. The energy contained in a sound wave is spread over an increasing area as it travels away from the source, so loudness decreases at greater distances from the noise source. Noise is defined as unwanted, intrusive, or unpleasant sound.

Sound level meters measure the air pressure fluctuations caused by sound waves, with separate measurements made for different sound frequency ranges. The decibel (dB) scale for describing sound uses a logarithmic scale to account for the large range of audible sound intensities. Most sounds consist of a broad range of sound frequencies, and several frequency-weighting schemes have been used to develop composite dB scales that approximate the way the human ear responds to noise levels. The A-weighted dB scale (dBA) is the most widely used for environmental noise assessments.

When distance is the only factor considered, sound levels from isolated point sources of noise typically decrease by about 6 dB for every doubling of distance from the noise source. When the noise source is a continuous line, such as vehicle traffic on a highway, sound levels decrease by about 3 dB for every doubling of distance. Noise levels can also be affected by several factors other than the distance from the noise source. Topographic features and structural barriers that absorb, reflect, or scatter sound waves can affect the reduction of noise levels. Atmospheric conditions (wind speed and direction, humidity levels, and temperatures) and the presence of dense vegetation can also affect the degree of sound attenuation.

Noises created during dredging would be attributed to the clamshell operating in the submerged aquatic environment. The measured sound exposure levels of a clamshell dredge may range between 75-88 dBA at 50 ft from the source. Animals have been observed flushing from haul out sites at a sound exposure level of less than 100 dBA, and it is possible that marine mammals may modify their behavior as a result of the noise produced by dredging operations (NMFS, 2009).

Based on Port of Los Angeles responses to comments on the Port of Los Angeles Channel Deepening Project EIR/EIS (2009), NMFS Comment NMFS 08, page 14-08, underwater noise from the clamshell dredging would be 150-162 dB (re1 µPa) in LA Harbor, which is below the designated level A harassment threshold of 190 dBrms (re 1 µPa) for pinnipeds. This would imply that clamshell (85 dBA = noise level at 50 feet from the source) and dredging effects for pinnipeds or other marine mammals near the Shipyard Sediment Site would be less than significant. No mitigation measure is proposed for noise production from dredging operations.

Noises created during offloading at each of the Potential Staging Areas would be attributed to the excavator operating on the dock and a bulldozer spreading dredged sediment at the dewatering pad. A standard size excavator and bulldozer produce approximately 80-90 dBA sound levels during operation. The noise produced from either piece of machinery will decrease as it travels away from the source. The duration of the excavator noise will be limited to material barge unloading episodes and bulldozer activity will be limited to episodes of dredged material being dumped at the dewatering pad requiring spreading. The rate at which the excavator/bulldozer will be operating will be provided in the final engineering plan; however, it is assumed that each piece of machinery would be operating approximately 7 hrs per work day. Noise attributed to offloading a material barge or spreading dredged sediment will not significantly affect aquatic marine life. It is assumed that noise produced from the offloading and dewatering activities will not significantly affect waterbirds (e.g., least tern) as these species will not be foraging in these upland areas.

The southern parcel of Potential Staging Area 5 is approximately 1,100 ft from the D Street Fill least tern nesting location (Figure 6). The typical noise level from an excavator/bulldozer 50 ft from the source is 82 and 85 dBA, respectively (Federal Transit Administration, 1995). If Staging Area 5 is selected as an offloading/dewatering site for the project, the noise produced from site machinery will not significantly affect the D Street least tern nesting location as the dBA sound levels from each source will be reduced below what is considered to be intrusive sound levels (< 70 dBA) due to the approximate distance (1,100 feet) from each location.

6.11 Invasive Species

Caulerpa taxifolia. This alga poses a substantial threat to marine ecosystems in Southern California, particularly to the extensive eelgrass meadows and other benthic environments that make coastal waters a rich and productive environment for fish and

birds. The eelgrass beds and other coastal resources that could be directly impacted by an invasion of *Caulerpa* are part of a food web that is critical to the survival of numerous native marine species, including the commercially and recreationally important species. This invasive alga essentially displaces the natural vegetation in areas where it becomes established and becomes the dominant plant life.

Mitigation Measure. Based on previous surveys at the shipyards, no *Caulerpa* has been observed within the Shipyard Sediment Site, which precludes the potential spread of this species during construction and/or the operation of the facilities. However, a *Caulerpa* algae survey will be conducted prior to construction activities to comply with permit applications for Corps Section 404 CWA and Section 10 of the Rivers and Harbors Act, and with the requirements of Section 305(b)(2) of the MSA. If this species is found, then protocols for the eradication of *Caulerpa* will be implemented to remove this species from the project area. The shipyards will conform to the 2008 Caulerpa Control Protocol, which requires survey results to be submitted to NOAA and CDFG within 15 days of completion. This protocol also requires that NOAA and CDFG be notified within 24 hours if *Caulerpa* is identified at a permitted project site.

7. CONCLUSIONS

Water Column Communities (Plankton and Fish). With the implementation of water quality BMPs (i.e., silt curtains and physical water quality monitoring), there will be no long-term effect on water column organisms.

Benthic Communities. The loss of hard and soft bottom benthic organisms as a consequence of dredging and sand covering operations is considered a short-term, less than significant loss of marine life. Upon the cessation of dredging and sand covering, benthic organisms are expected to recolonize the sediments, with full recolonization expected to be successful over a period of one to three years. Therefore, impacts to benthic communities are considered a short term, but less than significant impact.

California Brown Pelican. Construction activities may disturb the California brown pelican, if present during such activities. However, construction will disturb small areas of the Shipyard Sediment Site at any one time, leaving available other open water areas for this species to forage and feed.

California Least Tern. Construction activities may result in a temporary increase in turbidity and decrease in available fish for foraging. Therefore, the impacts to the California least tern due to dredging will be temporary and less than significant due to the small area that will be dredged, the temporary nature of the project and the availability of adjacent foraging habitat. Implementation of mitigation measures, such as a biologist monitoring for the presence of least tern, will reduce potential impacts to less than significant.

The California least tern has a moderate potential to occur at the Shipyard Sediment Site due to its foraging behavior from their nests (<5 miles). However, no known nesting areas are present at the project site. The California least tern is not expected to be significantly adversely affected as a result of the remedial dredging effort, since the Shipyard Sediment Site is a poor quality foraging site and higher quality foraging sites (i.e., eelgrass beds and shallow water habitat) are available short distances away from the site.

Double-Crested Cormorant. Construction activities may disturb the double-crested cormorant, if present during such activities. However, construction will disturb small areas of the Shipyard Sediment Site at any one time, leaving available other open water areas for this species to forage and feed.

California Grunion. Due to the lack of intertidal beach habitat and existing bulkhead and seawall that extends the entire length of the Shipyard Sediment Site, Grunion is not expected to spawn in this area. Therefore, no construction-related impacts will occur on this species or its habitat.

Steelhead Trout. There are no known populations of this species in San Diego Bay; therefore, there will be no construction-related impacts on Steelhead Trout EFH for salmonids.

Tidewater Goby. Tidewater gobies are not known to occur within San Diego Bay; no construction-related impacts will occur to this species or its habitat.

California Halibut. Adult and juvenile halibut are found in many areas of San Diego Bay, and they will potentially be present within the Shipyard Sediment Site. During dredging activities, juveniles in the immediate area will swim to areas outside the immediate impacted zone. No mortality is anticipated as a result of construction activities. Therefore, the level of impact on halibut is expected to be less than significant.

Eelgrass and Essential Fish Habitat. Dredging is expected to result in the loss of 100 percent of the eelgrass vegetation at both shipyards, which is considered EFH. This is an adverse, long-term but mitigatable impact. A mitigation program as described in Section 6.6 will be required to reduce the level of impact to less than significant with the successful restoration of eelgrass vegetation.

Fisheries Management Plan Species. Based upon the known distribution of one Coastal Pelagics FMP species and two Pacific Groundfish FMP species present in San Diego Bay, the Sediment Shipyard Site dredging and sand covering project will not have a significant impact on FMP species during the dredging and sand covering operations or long-term use of the shipyards.

Marine Mammals. Impacts related to potential vessel collisions and noise production from dredging operations are expected to be less than significant with the implementation of identified mitigation measures.

Sea Turtles. The potential for the dredging project to have adverse impacts on the green sea turtle is relatively low with the implementation of identified mitigation measures (e.g., silt curtains acting as a barrier for sea turtles to enter the project area). Since green sea turtles are known to inhabit the Bay, the likely impact that the project

might have on a sea turtle in the near vicinity of dredging operations would be a behavioral modification to avoid the construction area or transiting work vessel. No mortality is anticipated.

8. REFERENCES

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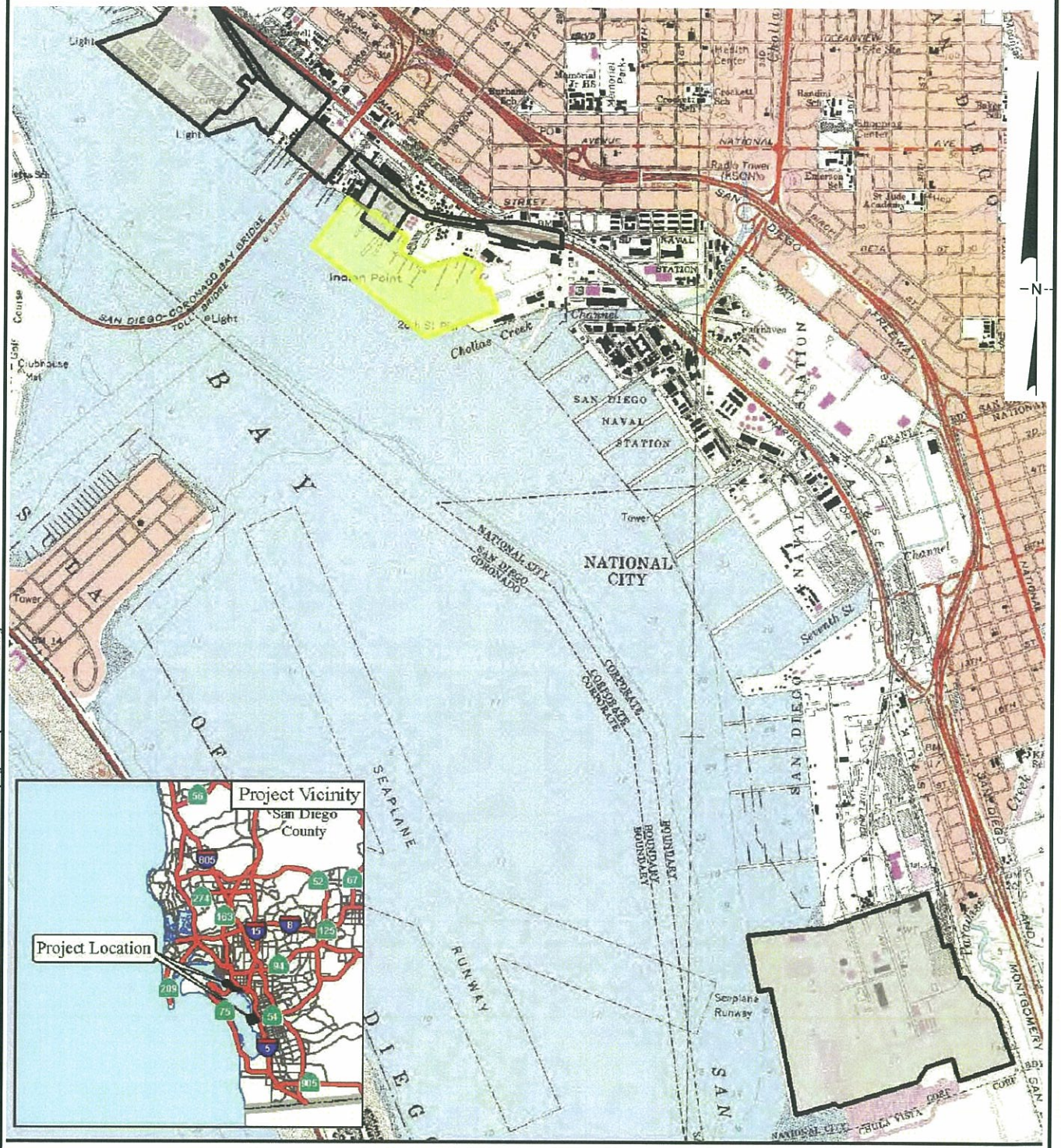

LEGEND

Shipyard Sediment Project Site

Potential Sediment Staging Areas

REFERENCE:
MERKEL & ASSOCIATES 2010
ESSENTIAL FISH HABITAT
ASSESSMENT FOR THE BAE SYSTEMS
LEASEHOLD PROJECTS, SAN DIEGO
BAY, CALIFORNIA.

PROJECT LOCATION
MARINE BIOLOGICAL RESOURCES ASSESSMENT
SHIPYARD SEDIMENT SITE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE:	APRIL 2011	FIGURE 1
PROJECT NO.	SC0552	

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LSA

LEGEND

Potential Sediment Staging Areas

FIGURE 2

0 1250 2500
FEET

POTENTIAL SEDIMENT STAGING AREAS MARINE BIOLOGICAL RESOURCES ASSESSMENT SHIPYARD SITE PROJECT SAN DIEGO, CALIFORNIA		
Geosyntec consultants	DATE: APRIL 2011	FIGURE 2
	PROJECT NO. SC0552	

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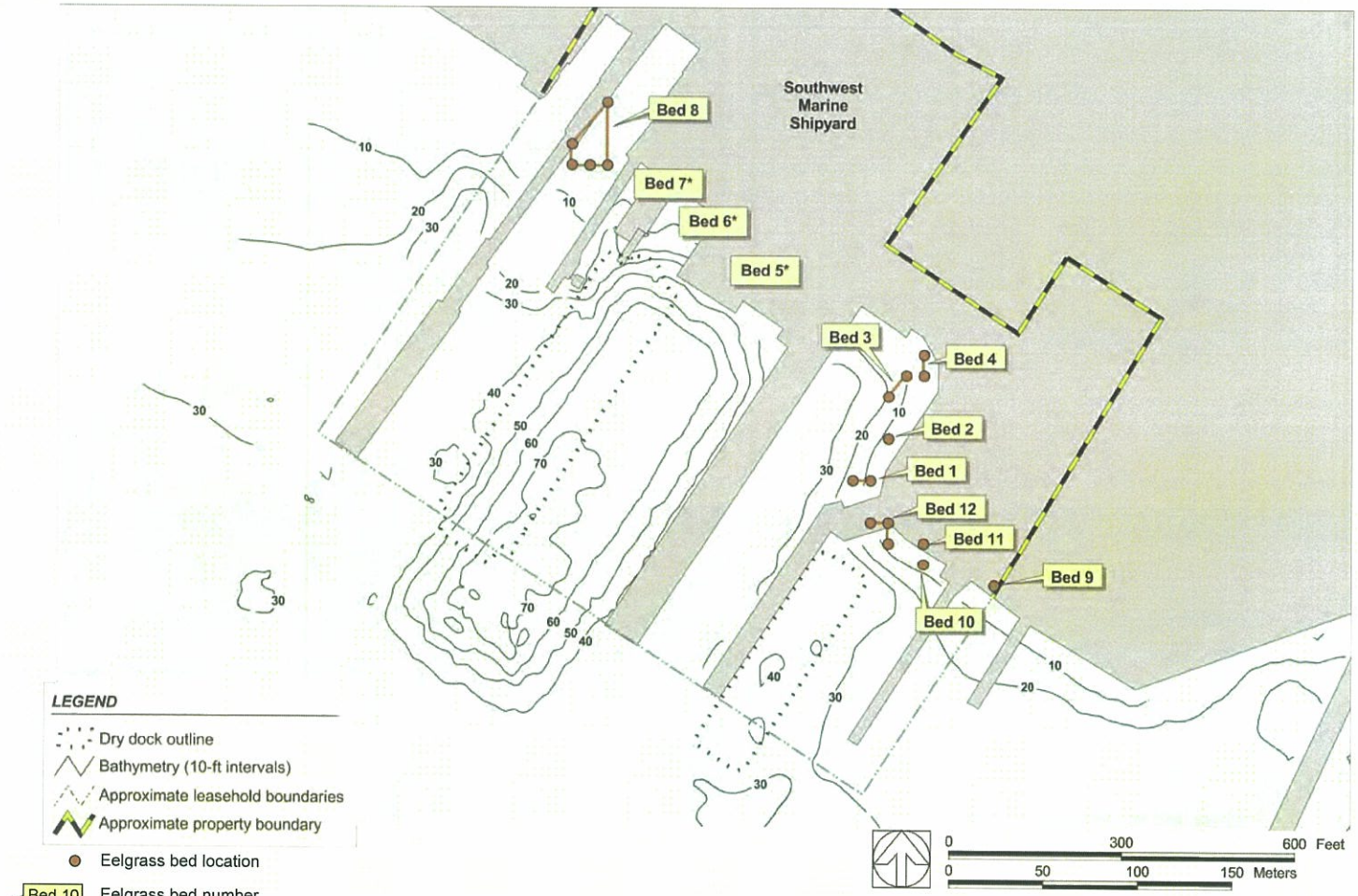

Note: * Approximate location of eelgrass bed

REFERENCE:
EXPONENT 2003 "NASSCO AND SOUTHWEST MARINE DETAILED SEDIMENT INVESTIGATION" REPORT

BATHYMETRY AND DISTRIBUTION OF EELGRASS AT BAE SYSTEMS
MARINE BIOLOGICAL RESOURCES ASSESSMENT
SHIPYARD SEDIMENT SITE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE:	APRIL 2011
PROJECT NO.	SC0552

FIGURE
3

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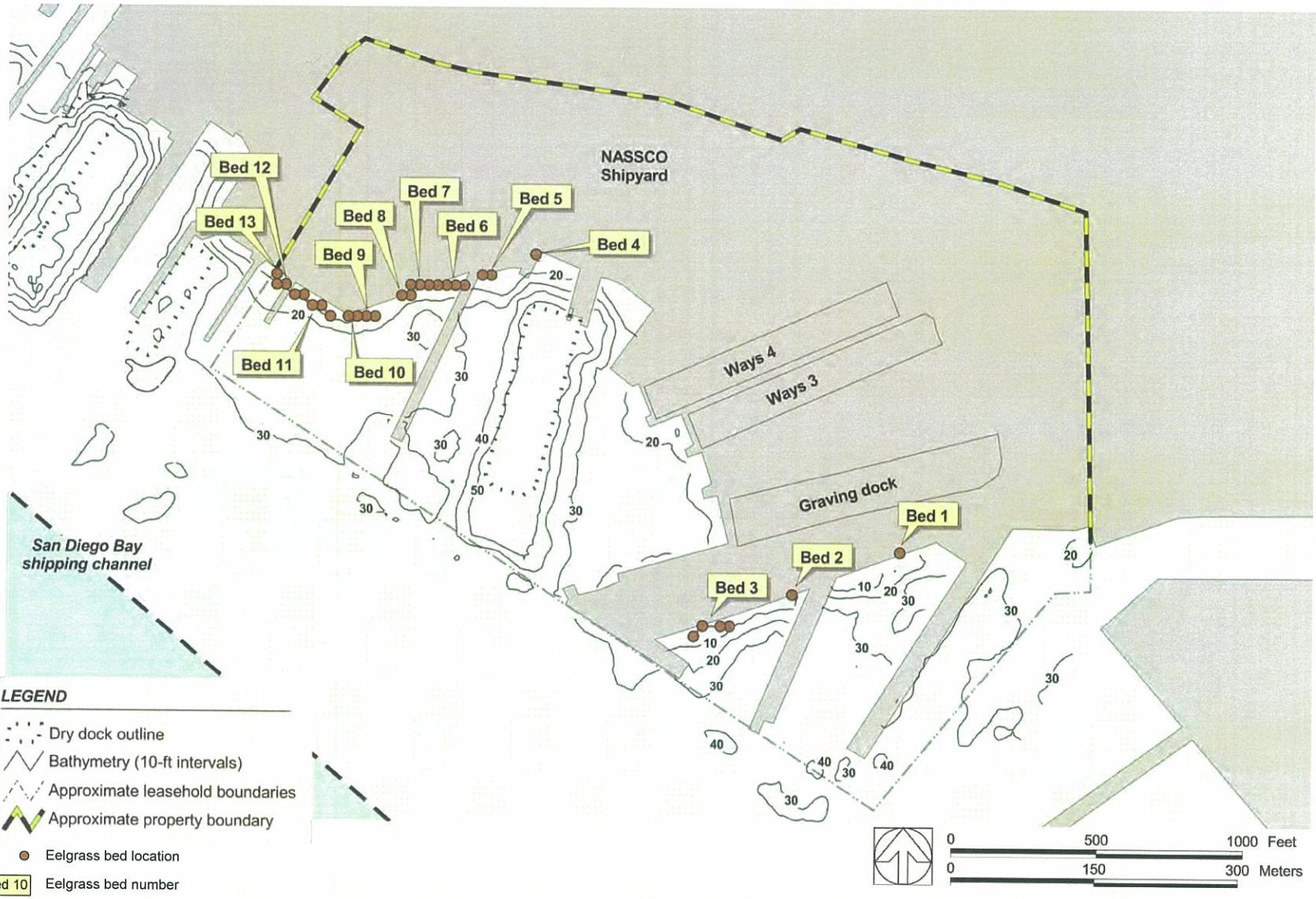

LEGEND

- Dry dock outline
- Bathymetry (10-ft intervals)
- Approximate leasehold boundaries
- Approximate property boundary
- Eelgrass bed location
- Bed 10 — Eelgrass bed number

Note: * Approximate location of eelgrass bed

REFERENCE:
EXPONENT 2003 "NASSCO AND SOUTHWEST MARINE DETAILED SEDIMENT INVESTIGATION" REPORT

BATHYMETRY AND DISTRIBUTION OF EELGRASS AT NASSCO
MARINE BIOLOGICAL RESOURCES ASSESSMENT
SHIPYARD SEDIMENT SITE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE: APRIL 2011

PROJECT NO. SC0552

FIGURE 4

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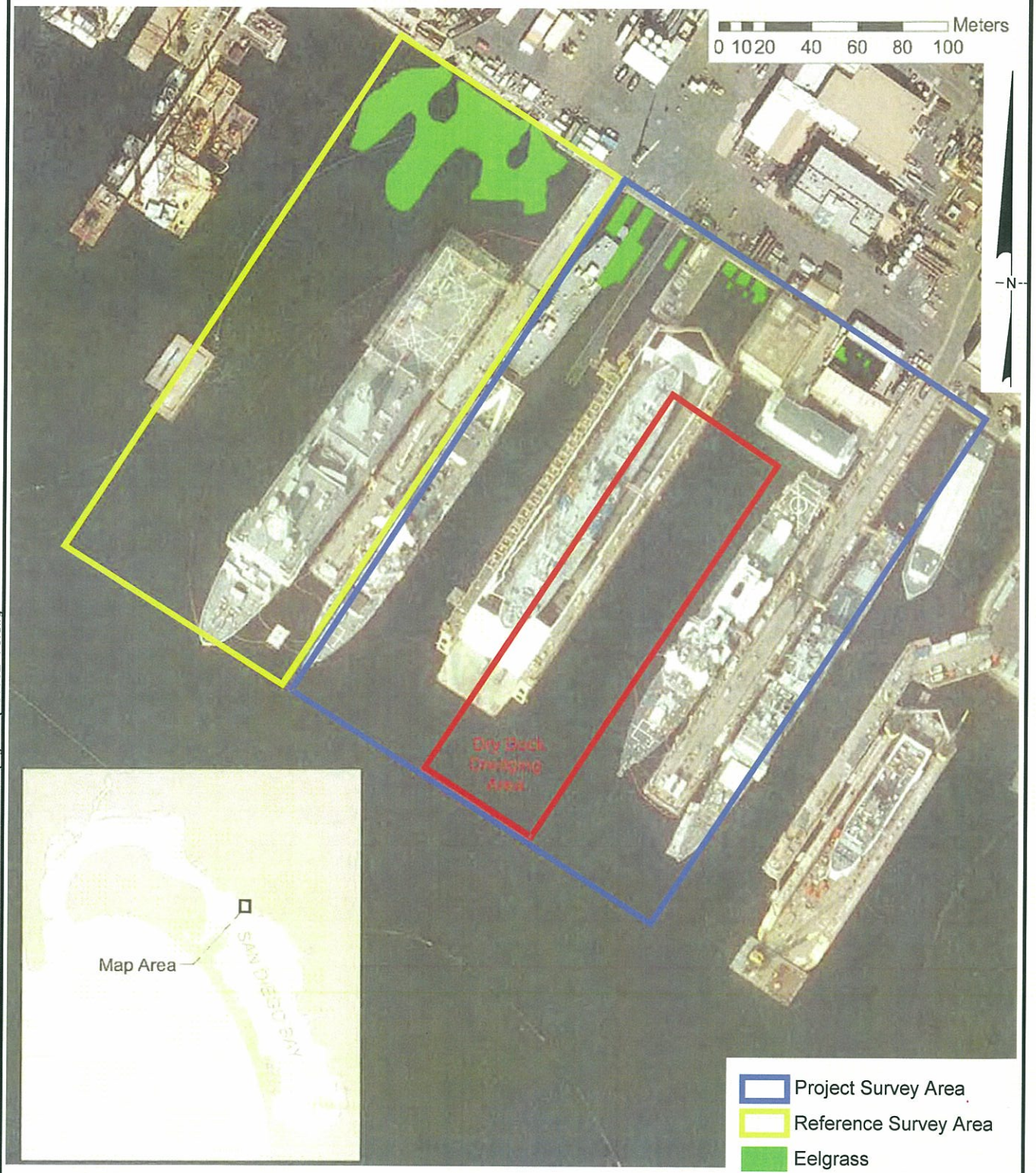

REFERENCE:
MERKEL & ASSOCIATES 2010
ESSENTIAL FISH HABITAT
ASSESSMENT FOR THE BAE SYSTEMS
LEASEHOLD PROJECTS, SAN DIEGO
BAY, CALIFORNIA.

EELGRASS SURVEY FOR 2010 BAE SYSTEMS
DRY DOCK SUMP MAINTENANCE DREDGE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE:	APRIL 2011	FIGURE 5
PROJECT NO.	SC0552	

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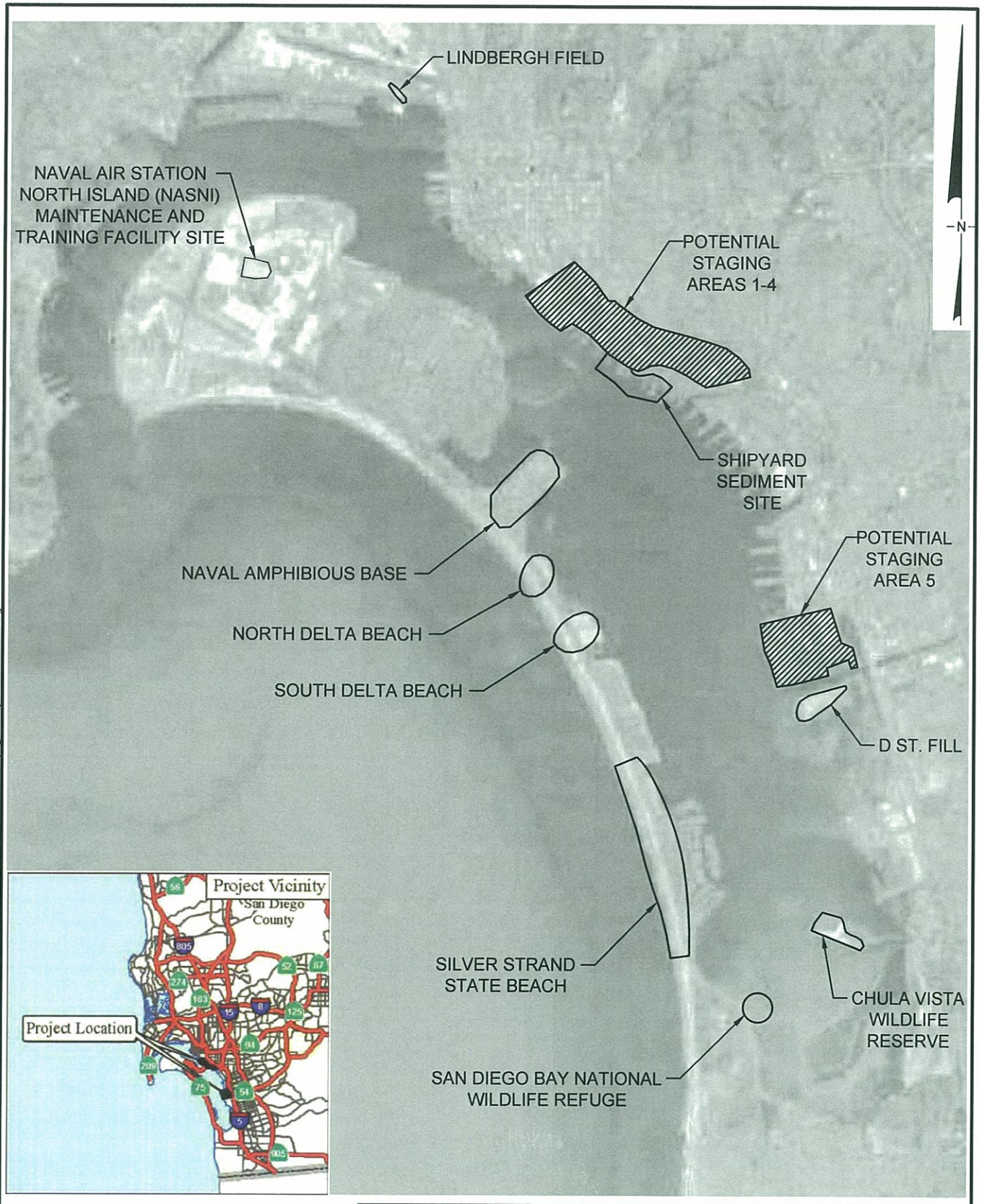

CALIFORNIA LEAST TERN NESTING LOCATIONS IN SAN DIEGO BAY IN RELATIONSHIP TO THE SHIPYARD SEDIMENT SITE AND THE POTENTIAL STAGING AREAS
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE:	APRIL 2011
PROJECT NO.	SC0552

FIGURE 6

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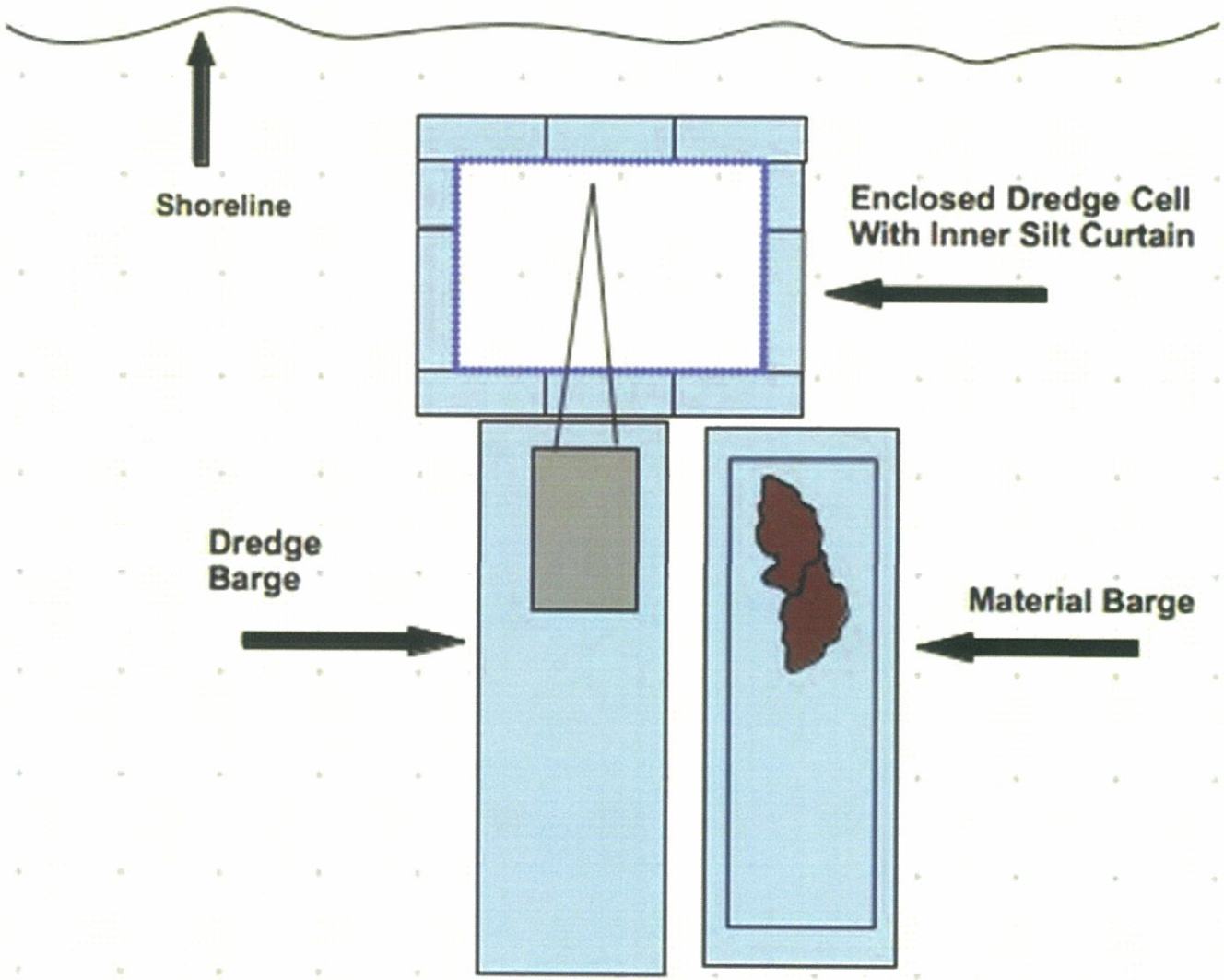

SILT CURTAIN CONTAINMENT: FLOATING DREDGE CELL
MARINE BIOLOGICAL RESOURCES ASSESSMENT
SHIPYARD SEDIMENT SITE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE: APRIL 2011

PROJECT NO. SC0552

FIGURE 7

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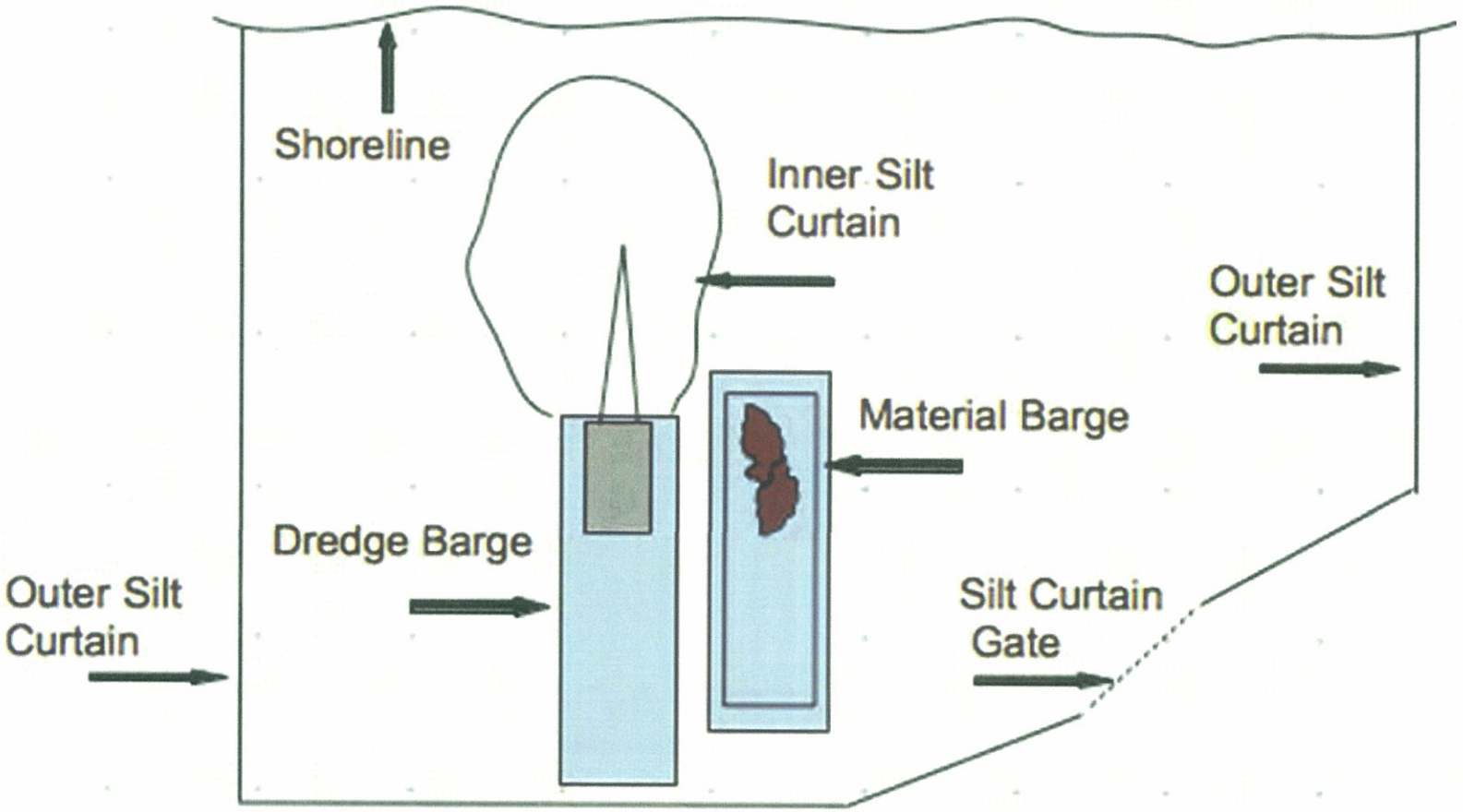

SILT CURTAIN CONTAINMENT: DOUBLE SILT CURTAIN
MARINE BIOLOGICAL RESOURCES ASSESSMENT
SHIPYARD SEDIMENT SITE PROJECT
SAN DIEGO, CALIFORNIA

Geosyntec consultants

DATE: APRIL 2011

PROJECT NO. SC0552

FIGURE 8

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Geosyntec
consultants

APPENDIX A

California Natural Diversity Database (CNDDB)
San Diego County Sensitive Species Descriptions

Record	COUNTY NAME	ELEMENT CODE	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS	DEPT FISH GAME STATUS	CALIFORNIA NATIVE PLANT SOCIETY LIST
1	San Diego	AAAAD04013	*Ensatina klauberi*	large-blotched salamander	None	None	SSC	
2	San Diego	AAAAF02032	*Taricha torosa*	Coast Range newt	None	None	SSC	
3	San Diego	AAABB01230	*Anaxyrus californicus*	arroyo toad	Endangered	None	SSC	
4	San Diego	AAABF02020	*Spea hammondii*	western spadefoot	None	None	SSC	
5	San Diego	AAABH01022	*Rana draytonii*	California red-legged frog	Threatened	None	SSC	
6	San Diego	AAABH01330	*Rana muscosa*	Sierra Madre yellow-legged frog	Endangered	Candidate Endangered	SSC	
7	San Diego	ABNFC01021	*Pelecanus occidentalis californicus*	California brown pelican	Delisted	Delisted	FP	
8	San Diego	ABNFD01020	*Phalacrocorax auritus*	double-crested cormorant	None	None	WL	
9	San Diego	ABNGA02010	*Ixobrychus exilis*	least bittern	None	None	SSC	
10	San Diego	ABNGE02020	*Plegadis chihi*	white-faced ibis	None	None	WL	
11	San Diego	ABNKC01010	*Pandion haliaetus*	osprey	None	None	WL	
12	San Diego	ABNKC06010	*Elanus leucurus*	white-tailed kite	None	None	FP	
13	San Diego	ABNKC11010	*Circus cyaneus*	northern harrier	None	None	SSC	
14	San Diego	ABNKC12040	*Accipiter cooperii*	Cooper's hawk	None	None	WL	
15	San Diego	ABNKC19120	*Buteo regalis*	ferruginous hawk	None	None	WL	
16	San Diego	ABNKC22010	*Aquila chrysaetos*	golden eagle	None	None	FP | WL	
17	San Diego	ABNKD06071	*Falco peregrinus anatum*	American peregrine falcon	Delisted	Delisted	FP	
18	San Diego	ABNKD06090	*Falco mexicanus*	prairie falcon	None	None	WL	
19	San Diego	ABNME03041	*Laterallus jamaicensis coturniculus*	California black rail	None	Threatened	FP	
20	San Diego	ABNME05014	*Rallus longirostris levipes*	light-footed clapper rail	Endangered	Endangered	FP	
21	San Diego	ABNNB03031	*Charadrius alexandrinus nivosus*	western snowy plover	Threatened	None	SSC	
22	San Diego	ABNNM08103	*Sternula antillarum browni*	California least tern	Endangered	Endangered	FP	
23	San Diego	ABNRB02022	*Coccyzus americanus occidentalis*	western yellow-billed cuckoo	Candidate	Endangered		
24	San Diego	ABNSB10010	*Athene cunicularia*	burrowing owl	None	None	SSC	
25	San Diego	ABNSB13010	*Asio otus*	long-eared owl	None	None	SSC	
26	San Diego	ABPAE33043	*Empidonax traillii extimus*	southwestern willow flycatcher	Endangered	Endangered		
27	San Diego	ABPAT02011	*Eremophila alpestris actia*	California horned lark	None	None	WL	
28	San Diego	ABPAU01010	*Progne subis*	purple martin	None	None	SSC	
29	San Diego	ABPAU08010	*Riparia riparia*	bank swallow	None	Threatened		
30	San Diego	ABPBG02095	*Campylorhynchus brunneicapillus sandiegensis*	coastal cactus wren	None	None	SSC	

Record	COUNTY NAME	ELEMENT CODE	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS	DEPT FISH GAME STATUS	CALIFORNIA NATIVE PLANT SOCIETY LIST
31	San Diego	ABPBJ08081	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None	SSC	
32	San Diego	ABPBR01030	*Lanius ludovicianus*	loggerhead shrike	None	None	SSC	
33	San Diego	ABPBW01114	*Vireo bellii pusillus*	least Bell's vireo	Endangered	Endangered		
34	San Diego	ABPBX03018	*Dendroica petechia brewsteri*	yellow warbler	None	None	SSC	
35	San Diego	ABPBX24010	*Icteria virens*	yellow-breasted chat	None	None	SSC	
36	San Diego	ABPBX91091	*Aimophila ruficeps canescens*	southern California rufous-crowned sparrow	None	None	WL	
37	San Diego	ABPBX96010	*Chondestes grammacus*	lark sparrow	None	None		
38	San Diego	ABPBX97021	*Amphispiza belli belli*	Bell's sage sparrow	None	None	WL	
39	San Diego	ABPBX99015	*Passerculus sandwichensis beldingi*	Belding's savannah sparrow	None	Endangered		
40	San Diego	ABPBXA0020	*Ammodramus savannarum*	grasshopper sparrow	None	None	SSC	
41	San Diego	ABPBXB0020	*Agelaius tricolor*	tricolored blackbird	None	None	SSC	
42	San Diego	AFCHA0209J	*Oncorhynchus mykiss irideus*	southern steelhead - southern California DPS	Endangered	None	SSC	
43	San Diego	AFCJB1303H	*Siphateles bicolor mohavensis*	Mohave tui chub	Endangered	Endangered	FP	
44	San Diego	AFCJB13120	*Gila orcuttii*	arroyo chub	None	None	SSC	
45	San Diego	AFCNB02060	*Cyprinodon macularius*	desert pupfish	Endangered	Endangered		
46	San Diego	AFCPA03011	*Gasterosteus aculeatus williamsoni*	unarmored threespine stickleback	Endangered	Endangered	FP	
47	San Diego	AFCQN04010	*Eucyclogobius newberryi*	tidewater goby	Endangered	None	SSC	
48	San Diego	AMACB01010	*Macrotus californicus*	California leaf-nosed bat	None	None	SSC	
49	San Diego	AMACB02010	*Choeronycteris mexicana*	Mexican long-tongued bat	None	None	SSC	
50	San Diego	AMACC01020	*Myotis yumanensis*	Yuma myotis	None	None		
51	San Diego	AMACC01070	*Myotis evotis*	long-eared myotis	None	None		
52	San Diego	AMACC01090	*Myotis thysanodes*	fringed myotis	None	None		
53	San Diego	AMACC01110	*Myotis volans*	long-legged myotis	None	None		
54	San Diego	AMACC01140	*Myotis ciliolabrum*	western small-footed myotis	None	None		
55	San Diego	AMACC02010	*Lasionycteris noctivagans*	silver-haired bat	None	None		
56	San Diego	AMACC05030	*Lasiurus cinereus*	hoary bat	None	None		
57	San Diego	AMACC05060	*Lasiurus blossevillii*	western red bat	None	None	SSC	
58	San Diego	AMACC05070	*Lasiurus xanthinus*	western yellow bat	None	None	SSC	
59	San Diego	AMACC07010	*Euderma maculatum*	spotted bat	None	None	SSC	
60	San Diego	AMACC08010	*Corynorhinus townsendii*	Townsend's big-eared bat	None	None	SSC	

Record	COUNTY NAME	ELEMENT CODE	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS	DEPT FISH GAME STATUS	CALIFORNIA NATIVE PLANT SOCIETY LIST
61	San Diego	AMACC10010	*Antrozous pallidus*	pallid bat	None	None	SSC	
62	San Diego	AMACD02011	*Eumops perotis californicus*	western mastiff bat	None	None	SSC	
63	San Diego	AMACD04010	*Nyctinomops femorosaccus*	pocketed free-tailed bat	None	None	SSC	
64	San Diego	AMACD04020	*Nyctinomops macrotis*	big free-tailed bat	None	None	SSC	
65	San Diego	AMAEB03051	*Lepus californicus bennettii*	San Diego black-tailed jackrabbit	None	None	SSC	
66	San Diego	AMAFD01041	*Perognathus longimembris brevinasus*	Los Angeles pocket mouse	None	None	SSC	
67	San Diego	AMAFD01042	*Perognathus longimembris pacificus*	Pacific pocket mouse	Endangered	None	SSC	
68	San Diego	AMAFD01044	*Perognathus longimembris internationalis*	Jacumba pocket mouse	None	None	SSC	
69	San Diego	AMAFD03100	*Dipodomys stephensi*	Stephens' kangaroo rat	Endangered	Threatened		
70	San Diego	AMAFD03144	*Dipodomys merriami collinus*	Earthquake Merriam's kangaroo rat	None	None		
71	San Diego	AMAFD05021	*Chaetodipus californicus femoralis*	Dulzura pocket mouse	None	None	SSC	
72	San Diego	AMAFD05031	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None	SSC	
73	San Diego	AMAFD05032	*Chaetodipus fallax pallidus*	pallid San Diego pocket mouse	None	None	SSC	
74	San Diego	AMAFF06022	*Onychomys torridus ramona*	southern grasshopper mouse	None	None	SSC	
75	San Diego	AMAFF08031	*Neotoma albigula venusta*	Colorado Valley woodrat	None	None		
76	San Diego	AMAFF08041	*Neotoma lepida intermedia*	San Diego desert woodrat	None	None	SSC	
77	San Diego	AMAJF04010	*Taxidea taxus*	American badger	None	None	SSC	
78	San Diego	AMALE04012	*Ovis canadensis nelsoni DPS*	peninsular bighorn sheep	Endangered	Threatened	FP	
79	San Diego	ARAAA02010	*Chelonia mydas*	green turtle	Threatened	None		
80	San Diego	ARAAD02030	*Emys marmorata*	western pond turtle	None	None	SSC	
81	San Diego	ARACC01012	*Anniella pulchra pulchra*	silvery legless lizard	None	None	SSC	
82	San Diego	ARACD01031	*Coleonyx variegatus abbotti*	San Diego banded gecko	None	None		
83	San Diego	ARACD01040	*Coleonyx switaki*	barefoot gecko	None	Threatened		
84	San Diego	ARACF12040	*Phrynosoma mcallii*	flat-tailed horned lizard	None	None	SSC	
85	San Diego	ARACF12100	*Phrynosoma blainvillii*	coast horned lizard	None	None	SSC	
86	San Diego	ARACF15020	*Uma notata*	Colorado Desert fringe-toed lizard	None	None	SSC	
87	San Diego	ARACH01114	*Plestiodon skiltonianus interparietalis*	Coronado Island skink	None	None	SSC	
88	San Diego	ARACJ02060	*Aspidoscelis hyperythra*	orangethroat whiptail	None	None	SSC	
89	San Diego	ARACJ02143	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		
90	San Diego	ARACK01040	*Xantusia gracilis*	sandstone night lizard	None	None	SSC	

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91	San Diego	ARADA01020	*Charina trivirgata*	rosy boa	None	None		
92	San Diego	ARADB1001A	*Diadophis punctatus similis*	San Diego ringneck snake	None	None		
93	San Diego	ARADB19063	*Lampropeltis zonata (pulchra)*	California mountain kingsnake (San Diego population)	None	None	SSC	
94	San Diego	ARADB30033	*Salvadora hexalepis virgultea*	coast patch-nosed snake	None	None	SSC	
95	San Diego	ARADB3613F	*Thamnophis sirtalis ssp.*	south coast garter snake	None	None	SSC	
96	San Diego	ARADB36160	*Thamnophis hammondii*	two-striped garter snake	None	None	SSC	
97	San Diego	ARADE02090	*Crotalus ruber*	red-diamond rattlesnake	None	None	SSC	
98	San Diego	CTT21230CA	*Southern Foredunes*	Southern Foredunes	None	None		
99	San Diego	CTT21330CA	*Southern Dune Scrub*	Southern Dune Scrub	None	None		
100	San Diego	CTT32400CA	*Maritime Succulent Scrub*	Maritime Succulent Scrub	None	None		
101	San Diego	CTT34220CA	*Mojave Mixed Steppe*	Mojave Mixed Steppe	None	None		
102	San Diego	CTT37C30CA	*Southern Maritime Chaparral*	Southern Maritime Chaparral	None	None		
103	San Diego	CTT42110CA	*Valley Needlegrass Grassland*	Valley Needlegrass Grassland	None	None		
104	San Diego	CTT44321CA	*San Diego Mesa Hardpan Vernal Pool*	San Diego Mesa Hardpan Vernal Pool	None	None		
105	San Diego	CTT44322CA	*San Diego Mesa Claypan Vernal Pool*	San Diego Mesa Claypan Vernal Pool	None	None		
106	San Diego	CTT52120CA	*Southern Coastal Salt Marsh*	Southern Coastal Salt Marsh	None	None		
107	San Diego	CTT52200CA	*Coastal Brackish Marsh*	Coastal Brackish Marsh	None	None		
108	San Diego	CTT61300CA	*Southern Riparian Forest*	Southern Riparian Forest	None	None		
109	San Diego	CTT61310CA	*Southern Coast Live Oak Riparian Forest*	Southern Coast Live Oak Riparian Forest	None	None		
110	San Diego	CTT61330CA	*Southern Cottonwood Willow Riparian Forest*	Southern Cottonwood Willow Riparian Forest	None	None		
111	San Diego	CTT61700CA	*Mojave Riparian Forest*	Mojave Riparian Forest	None	None		
112	San Diego	CTT61810CA	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	None	None		
113	San Diego	CTT61820CA	*Mesquite Bosque*	Mesquite Bosque	None	None		
114	San Diego	CTT62300CA	*Desert Fan Palm Oasis Woodland*	Desert Fan Palm Oasis Woodland	None	None		
115	San Diego	CTT62400CA	*Southern Sycamore Alder Riparian Woodland*	Southern Sycamore Alder Riparian Woodland	None	None		
116	San Diego	CTT63300CA	*Southern Riparian Scrub*	Southern Riparian Scrub	None	None		
117	San Diego	CTT63320CA	*Southern Willow Scrub*	Southern Willow Scrub	None	None		
118	San Diego	CTT83140CA	*Torrey Pine Forest*	Torrey Pine Forest	None	None		
119	San Diego	CTT83230CA	*Southern Interior Cypress Forest*	Southern Interior Cypress Forest	None	None		
120	San Diego	ICBRA03060	*Branchinecta sandiegonensis*	San Diego fairy shrimp	Endangered	None		

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121	San Diego	ICBRA07010	*Streptocephalus woottoni*	Riverside fairy shrimp	Endangered	None		
122	San Diego	IICOL02080	*Cicindela gabbii*	western tidal-flat tiger beetle	None	None		
123	San Diego	IICOL02101	*Cicindela hirticollis gravida*	sandy beach tiger beetle	None	None		
124	San Diego	IICOL02113	*Cicindela latesignata latesignata*	western beach tiger beetle	None	None		
125	San Diego	IICOL02121	*Cicindela senilis frosti*	senile tiger beetle	None	None		
126	San Diego	IICOL30050	*Anomala carlsoni*	Carlson's dune beetle	None	None		
127	San Diego	IICOL4A010	*Coelus globosus*	globose dune beetle	None	None		
128	San Diego	IIHYM73010	*Parnopes borregoensis*	Borrego parnopes cuckoo wasp	None	None		
129	San Diego	IIHYM74010	*Melitta californica*	A mellitid bee	None	None		
130	San Diego	IIHYM75010	*Halictus harmonius*	haromonius halictid bee	None	None		
131	San Diego	IILEP38021	*Pyrgus ruralis lagunae*	Laguna Mountains skipper	Endangered	None		
132	San Diego	IILEP84030	*Panoquina errans*	wandering (=saltmarsh) skipper	None	None		
133	San Diego	IILEPC1160	*Lycaena hermes*	Hermes copper butterfly	None	None		
134	San Diego	IILEPE2150	*Callophrys thornei*	Thorne's hairstreak	None	None		
135	San Diego	IILEPK405L	*Euphydryas editha quino*	quino checkerspot butterfly	Endangered	None		
136	San Diego	IILEPP2010	*Danaus plexippus*	monarch butterfly	None	None		
137	San Diego	IMGASC2530	*Helminthoglypta coelata*	mesa shoulderband	None	None		
138	San Diego	IMGASC2560	*Helminthoglypta milleri*	peak shoulderband	None	None		
139	San Diego	IMGASC5100	*Rothelix warnerfontis*	Warner Springs shoulderband	None	None		
140	San Diego	IMGASJ7040	*Tryonia imitator*	mimic tryonia (=California brackishwater snail)	None	None		
141	San Diego	NBHEP1C010	*Geothallus tuberosus*	Campbell's liverwort	None	None		1B.1
142	San Diego	NBHEP35030	*Sphaerocarpos drewei*	bottle liverwort	None	None		1B.1
143	San Diego	NBMUS7L090	*Tortula californica*	California screw moss	None	None		1B.2
144	San Diego	NBMUS7S010	*Triquetrella californica*	coastal triquetrella	None	None		1B.2
145	San Diego	NBMUSA1010	*Schizymenium shevockii*	Shevock's copper moss	None	None		1B.2
146	San Diego	NLT0018660	*Mobergia calculiformis*	light gray lichen	None	None		
147	San Diego	NLTEST7980	*Texosporium sancti-jacobi*	woven-spored lichen	None	None		
148	San Diego	PDACA07010	*Carlowrightia arizonica*	Arizona carlowrightia	None	None		2.2
149	San Diego	PDANA080B5	*Rhus trilobata var. simplicifolia*	single-leaved skunkbrush	None	None		2.3
150	San Diego	PDAPI0Z042	*Eryngium aristulatum var. parishii*	San Diego button-celery	Endangered	Endangered		1B.1

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151	San Diego	PDAPI0Z120	*Eryngium pendletonense*	Pendleton button-celery	None	None		1B.1
152	San Diego	PDAPI23020	*Spermolepis echinata*	bristly scaleseed	None	None		2.3
153	San Diego	PDASC0A0J0	*Matelea parvifolia*	spear-leaf matelea	None	None		2.3
154	San Diego	PDAST0C080	*Ambrosia chenopodiifolia*	San Diego bur-sage	None	None		2.1
155	San Diego	PDAST0C0M0	*Ambrosia pumila*	San Diego ambrosia	Endangered	None		1B.1
156	San Diego	PDAST0S160	*Artemisia palmeri*	San Diego sagewort	None	None		4.2
157	San Diego	PDAST0W0P0	*Baccharis vanessae*	Encinitas baccharis	Threatened	Endangered		1B.1
158	San Diego	PDAST20042	*Chaenactis carphoclinia var. peirsonii*	Peirson's pincushion	None	None		1B.3
159	San Diego	PDAST20095	*Chaenactis glabriuscula var. orcuttiana*	Orcutt's pincushion	None	None		1B.1
160	San Diego	PDAST200D0	*Chaenactis parishii*	Parish's chaenactis	None	None		1B.3
161	San Diego	PDAST2L0L0	*Leptosyne maritima*	sea dahlia	None	None		2.2
162	San Diego	PDAST2M025	*Corethrogyne filaginifolia var. incana*	San Diego sand aster	None	None		1B.1
163	San Diego	PDAST2M027	*Corethrogyne filaginifolia var. linifolia*	Del Mar Mesa sand aster	None	None		1B.1
164	San Diego	PDAST3L062	*Ericameria cuneata var. macrocephala*	Laguna Mountains goldenbush	None	None		1B.3
165	San Diego	PDAST3L0C1	*Ericameria palmeri var. palmeri*	Palmer's goldenbush	None	None		1B.1
166	San Diego	PDAST42020	*Geraea viscida*	sticky geraea	None	None		2.3
167	San Diego	PDAST440C0	*Pseudognaphalium leucocephalum*	white rabbit-tobacco	None	None		2.2
168	San Diego	PDAST470D4	*Grindelia hallii*	San Diego gumplant	None	None		1B.2
169	San Diego	PDAST4H070	*Hazardia orcuttii*	Orcutt's hazardia	Candidate	Threatened		1B.1
170	San Diego	PDAST4N0Z2	*Helianthus niveus ssp. tephrodes*	Algodones Dunes sunflower	None	Endangered		1B.2
171	San Diego	PDAST4R070	*Deinandra conjugens*	Otay tarplant	Threatened	Endangered		1B.1
172	San Diego	PDAST4R0B0	*Deinandra floribunda*	Tecate tarplant	None	None		1B.2
173	San Diego	PDAST4R0K0	*Deinandra mohavensis*	Mojave tarplant	None	Endangered		1B.3
174	San Diego	PDAST4R0P4	*Centromadia parryi ssp. australis*	southern tarplant	None	None		1B.1
175	San Diego	PDAST4R0R4	*Centromadia pungens ssp. laevis*	smooth tarplant	None	None		1B.1
176	San Diego	PDAST4V0K2	*Heterotheca sessiliflora ssp. sessiliflora*	beach goldenaster	None	None		1B.1
177	San Diego	PDAST4Z030	*Hulsea californica*	San Diego hulsea	None	None		1B.3
178	San Diego	PDAST4Z050	*Hulsea mexicana*	Mexican hulsea	None	None		2.3
179	San Diego	PDAST50010	*Ambrosia monogyra*	singlewhorl burrobrush	None	None		2.2
180	San Diego	PDAST57091	*Isocoma menziesii var. decumbens*	decumbent goldenbush	None	None		1B.2

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181	San Diego	PDAST580A0	*Iva hayesiana*	San Diego marsh-elder	None	None		2.2
182	San Diego	PDAST5L0A1	*Lasthenia glabrata ssp. coulteri*	Coulter's goldfields	None	None		1B.1
183	San Diego	PDAST5S022	*Lessingia glandulifera var. tomentosa*	Warner Springs lessingia	None	None		1B.3
184	San Diego	PDAST64131	*Dieteria asteroides var. lagunensis*	Mount Laguna aster	None	Rare		2.1
185	San Diego	PDAST67010	*Malperia tenuis*	brown turbans	None	None		2.3
186	San Diego	PDAST8H060	*Senecio aphanactis*	chaparral ragwort	None	None		2.2
187	San Diego	PDAST8H1F0	*Packera ganderi*	Gander's ragwort	None	Rare		1B.2
188	San Diego	PDAST8Y070	*Stylocline citroleum*	oil neststraw	None	None		1B.1
189	San Diego	PDAST9T0S0	*Viguiera purisimae*	La Purisima viguiera	None	None		2.3
190	San Diego	PDASTA1040	*Xylorhiza orcuttii*	Orcutt's woody-aster	None	None		1B.2
191	San Diego	PDASTE80C0	*Symphyotrichum defoliatum*	San Bernardino aster	None	None		1B.2
192	San Diego	PDBER06060	*Berberis fremontii*	Fremont barberry	None	None		3
193	San Diego	PDBER060A0	*Berberis nevinii*	Nevin's barberry	Endangered	Endangered		1B.1
194	San Diego	PDBOR0A120	*Cryptantha ganderi*	Gander's cryptantha	None	None		1B.1
195	San Diego	PDBOR0H010	*Harpagonella palmeri*	Palmer's grapplinghook	None	None		4.2
196	San Diego	PDBRA064D0	*Arabis hirshbergiae*	Hirshberg's rock-cress	None	None		1B.2
197	San Diego	PDBRA0M0H0	*Caulanthus simulans*	Payson's jewel-flower	None	None		4.2
198	San Diego	PDBRA16010	*Erysimum ammophilum*	sand-loving wallflower	None	None		1B.2
199	San Diego	PDBRA1M0B1	*Lepidium flavum var. felipense*	Borrego Valley pepper-grass	None	None		1B.2
200	San Diego	PDBRA1M114	*Lepidium virginicum var. robinsonii*	Robinson's pepper-grass	None	None		1B.2
201	San Diego	PDBRA2G060	*Streptanthus bernardinus*	Laguna Mountains jewel-flower	None	None		4.3
202	San Diego	PDBRA2G0B0	*Streptanthus campestris*	southern jewel-flower	None	None		1B.3
203	San Diego	PDBRA32010	*Sibaropsis hammittii*	Hammitt's clay-cress	None	None		1B.2
204	San Diego	PDBUR01020	*Bursera microphylla*	little-leaf elephant tree	None	None		2.3
205	San Diego	PDCAC08060	*Ferocactus viridescens*	San Diego barrel cactus	None	None		2.1
206	San Diego	PDCAC0D1P0	*Opuntia wigginsii*	Wiggins' cholla	None	None		3.3
207	San Diego	PDCAC0D2U0	*Cylindropuntia xfosbergii*	pink cholla	None	None		3
208	San Diego	PDCAC0D2Y1	*Opuntia californica var. californica*	snake cholla	None	None		1B.1
209	San Diego	PDCAC11010	*Bergerocactus emoryi*	golden-spined cereus	None	None		2.2
210	San Diego	PDCAM06041	*Downingia concolor var. brevior*	Cuyamaca Lake downingia	None	Endangered		1B.1

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211	San Diego	PDCAM07023	*Githopsis diffusa ssp. filicaulis*	Mission Canyon bluecup	None	None		3.1
212	San Diego	PDCHE02010	*Aphanisma blitoides*	aphanisma	None	None		1B.2
213	San Diego	PDCHE040E0	*Atriplex coulteri*	Coulter's saltbush	None	None		1B.2
214	San Diego	PDCHE041C0	*Atriplex pacifica*	South Coast saltscale	None	None		1B.2
215	San Diego	PDCHE041D0	*Atriplex parishii*	Parish's brittlescale	None	None		1B.1
216	San Diego	PDCHE041T1	*Atriplex serenana var. davidsonii*	Davidson's saltscale	None	None		1B.2
217	San Diego	PDCHE0P0D0	*Suaeda esteroa*	estuary seablite	None	None		1B.2
218	San Diego	PDCPP09015	*Wislizenia refracta ssp. palmeri*	Palmer's jackass clover	None	None		2.2
219	San Diego	PDCRA04031	*Dudleya attenuata ssp. orcuttii*	Orcutt's dudleya	None	None		2.1
220	San Diego	PDCRA04051	*Dudleya blochmaniae ssp. blochmaniae*	Blochman's dudleya	None	None		1B.1
221	San Diego	PDCRA04053	*Dudleya brevifolia*	short-leaved dudleya	None	Endangered		1B.1
222	San Diego	PDCRA040H0	*Dudleya multicaulis*	many-stemmed dudleya	None	None		1B.2
223	San Diego	PDCRA040R0	*Dudleya variegata*	variegated dudleya	None	None		1B.2
224	San Diego	PDCRA040T0	*Dudleya viscida*	sticky dudleya	None	None		1B.2
225	San Diego	PDERI040E8	*Arctostaphylos glandulosa ssp. crassifolia*	Del Mar manzanita	Endangered	None		1B.1
226	San Diego	PDERI040Y0	*Arctostaphylos otayensis*	Otay manzanita	None	None		1B.2
227	San Diego	PDERI042T0	*Arctostaphylos rainbowensis*	Rainbow manzanita	None	None		1B.1
228	San Diego	PDERI0B011	*Comarostaphylis diversifolia ssp. diversifolia*	summer holly	None	None		1B.2
229	San Diego	PDERI0W010	*Ornithostaphylos oppositifolia*	Baja California birdbush	None	Endangered		2.1
230	San Diego	PDEUP0D010	*Chamaesyce abramsiana*	Abrams' spurge	None	None		2.2
231	San Diego	PDEUP0D060	*Chamaesyce arizonica*	Arizona spurge	None	None		2.3
232	San Diego	PDEUP0D1X0	*Chamaesyce platysperma*	flat-seeded spurge	None	None		1B.2
233	San Diego	PDEUP0Q1B0	*Euphorbia misera*	cliff spurge	None	None		2.2
234	San Diego	PDEUP1C010	*Tetracoccus dioicus*	Parry's tetracoccus	None	None		1B.2
235	San Diego	PDFAB0F2R0	*Astragalus deanei*	Dean's milk-vetch	None	None		1B.1
236	San Diego	PDFAB0F303	*Astragalus douglasii var. perstrictus*	Jacumba milk-vetch	None	None		1B.2
237	San Diego	PDFAB0F491	*Astragalus insularis var. harwoodii*	Harwood's milk-vetch	None	None		2.2
238	San Diego	PDFAB0F532	*Astragalus magdalenae var. peirsonii*	Peirson's milk-vetch	Threatened	Endangered		1B.2
239	San Diego	PDFAB0F6B0	*Astragalus oocarpus*	San Diego milk-vetch	None	None		1B.2
240	San Diego	PDFAB0F6G1	*Astragalus pachypus var. jaegeri*	Jaeger's milk-vetch	None	None		1B.1

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241	San Diego	PDFAB0F8R2	*Astragalus tener var. titi*	coastal dunes milk-vetch	Endangered	Endangered		1B.1
242	San Diego	PDFAB0N040	*Calliandra eriophylla*	pink fairy-duster	None	None		2.3
243	San Diego	PDFAB2A092	*Hosackia crassifolius var. otayensis*	Otay Mountain lotus	None	None		1B.1
244	San Diego	PDFAB2A0H0	*Acmispon haydonii*	pygmy lotus	None	None		1B.3
245	San Diego	PDFAB2A0V0	*Lotus nuttallianus*	Nuttall's lotus	None	None		1B.1
246	San Diego	PDFAB2B1J5	*Lupinus excubitus var. medius*	Mountain Springs bush lupine	None	None		1B.3
247	San Diego	PDFAB3Z013	*Thermopsis californica var. semota*	velvety false lupine	None	None		1B.2
248	San Diego	PDFAB491X0	*Senna covesii*	Cove's cassia	None	None		2.2
249	San Diego	PDFAG050D0	*Quercus dumosa*	Nuttall's scrub oak	None	None		1B.1
250	San Diego	PDFAG05650	*Quercus cedrosensis*	Cedros Island oak	None	None		2.2
251	San Diego	PDFRA01040	*Frankenia palmeri*	Palmer's frankenia	None	None		2.1
252	San Diego	PDGER01070	*California macrophylla*	round-leaved filaree	None	None		1B.1
253	San Diego	PDGRO02070	*Ribes canthariforme*	Moreno currant	None	None		1B.3
254	San Diego	PDGRO021P0	*Ribes viburnifolium*	Santa Catalina Island currant	None	None		1B.2
255	San Diego	PDHYD0A0H0	*Nama stenocarpum*	mud nama	None	None		2.2
256	San Diego	PDHYD0C510	*Phacelia stellaris*	Brand's star phacelia	Candidate	None		1B.1
257	San Diego	PDHYD0D011	*Pholistoma auritum var. arizonicum*	Arizona pholistoma	None	None		2.3
258	San Diego	PDLAM01010	*Acanthomintha ilicifolia*	San Diego thorn-mint	Threatened	Endangered		1B.1
259	San Diego	PDLAM08030	*Satureja chandleri*	San Miguel savory	None	None		1B.2
260	San Diego	PDLAM0V020	*Lepechinia cardiophylla*	heart-leaved pitcher sage	None	None		1B.2
261	San Diego	PDLAM0V040	*Lepechinia ganderi*	Gander's pitcher sage	None	None		1B.3
262	San Diego	PDLAM180A2	*Monardella hypoleuca ssp. lanata*	felt-leaved monardella	None	None		1B.2
263	San Diego	PDLAM180D4	*Monardella viminea*	willowy monardella	Endangered	Endangered		1B.1
264	San Diego	PDLAM180E1	*Monardella macrantha ssp. hallii*	Hall's monardella	None	None		1B.3
265	San Diego	PDLAM180F2	*Monardella nana ssp. leptosiphon*	San Felipe monardella	None	None		1B.2
266	San Diego	PDLAM180Y0	*Monardella stoneana*	Jennifer's monardella	None	None		1B.2
267	San Diego	PDLAM1K010	*Pogogyne abramsii*	San Diego mesa mint	Endangered	Endangered		1B.1
268	San Diego	PDLAM1K040	*Pogogyne nudiuscula*	Otay Mesa mint	Endangered	Endangered		1B.1
269	San Diego	PDLAM1S140	*Salvia munzii*	Munz's sage	None	None		2.2
270	San Diego	PDLAM1U0A1	*Scutellaria bolanderi ssp. austromontana*	southern mountains skullcap	None	None		1B.2

Record	COUNTY NAME	ELEMENT CODE	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS	DEPT FISH GAME STATUS	CALIFORNIA NATIVE PLANT SOCIETY LIST
271	San Diego	PDLIM02052	*Limnanthes gracilis ssp. parishii*	Parish's meadowfoam	None	Endangered		1B.2
272	San Diego	PDLOA02020	*Eucnide rupestris*	annual rock-nettle	None	None		2.2
273	San Diego	PDLOA030K0	*Mentzelia hirsutissima*	hairy stickleaf	None	None		2.3
274	San Diego	PDMAL0F010	*Herissantia crispa*	curly herissantia	None	None		2.3
275	San Diego	PDMAL110J0	*Sidalcea neomexicana*	Salt Spring checkerbloom	None	None		2.2
276	San Diego	PDNYC010P1	*Abronia villosa var. aurita*	chaparral sand-verbena	None	None		1B.1
277	San Diego	PDOLE040K0	*Fraxinus parryi*	chaparral ash	None	None		2.2
278	San Diego	PDONA050D0	*Clarkia delicata*	delicate clarkia	None	None		1B.2
279	San Diego	PDORO040A2	*Orobanche parishii ssp. brachyloba*	short-lobed broomrape	None	None		4.2
280	San Diego	PDPGN040G0	*Chorizanthe orcuttiana*	Orcutt's spineflower	Endangered	Endangered		1B.1
281	San Diego	PDPGN040K1	*Chorizanthe polygonoides var. longispina*	long-spined spineflower	None	None		1B.2
282	San Diego	PDPGN040Z1	*Chorizanthe xanti var. leucotheca*	white-bracted spineflower	None	None		1B.2
283	San Diego	PDPGN08780	*Eriogonum evanidum*	vanishing wild buckwheat	None	None		1B.1
284	San Diego	PDPGN0G011	*Nemacaulis denudata var. denudata*	coast woolly-heads	None	None		1B.2
285	San Diego	PDPGN0G012	*Nemacaulis denudata var. gracilis*	slender cottonheads	None	None		2.2
286	San Diego	PDPLM030B1	*Eriastrum harwoodii*	Harwood's eriastrum	None	None		1B.2
287	San Diego	PDPLM060J0	*Ipomopsis tenuifolia*	slender-leaved ipomopsis	None	None		2.3
288	San Diego	PDPLM09070	*Linanthus bellus*	desert beauty	None	None		2.3
289	San Diego	PDPLM090J3	*Leptosiphon floribundus ssp. hallii*	Santa Rosa Mountains leptosiphon	None	None		1B.3
290	San Diego	PDPLM090X0	*Linanthus orcuttii*	Orcutt's linanthus	None	None		1B.3
291	San Diego	PDPLM0C080	*Navarretia fossalis*	Moran's nosegay	Threatened	None		1B.1
292	San Diego	PDPLM0C0L0	*Navarretia peninsularis*	Baja navarretia	None	None		1B.2
293	San Diego	PDPLM0C0Q0	*Navarretia prostrata*	prostrate vernal pool navarretia	None	None		1B.1
294	San Diego	PDPOR04010	*Lewisia brachycalyx*	short-sepaled lewisia	None	None		2.2
295	San Diego	PDRAF01010	*Pilostyles thurberi*	Thurber's pilostyles	None	None		4.3
296	San Diego	PDRAN0B0U1	*Delphinium hesperium ssp. cuyamacae*	Cuyamaca larkspur	None	Rare		1B.2
297	San Diego	PDRAN0H031	*Myosurus minimus ssp. apus*	little mousetail	None	None		3.1
298	San Diego	PDRHA01010	*Adolphia californica*	California adolphia	None	None		2.1
299	San Diego	PDRHA04070	*Ceanothus cyaneus*	Lakeside ceanothus	None	None		1B.2
300	San Diego	PDRHA041J0	*Ceanothus verrucosus*	wart-stemmed ceanothus	None	None		2.2

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301	San Diego	PDRHA04430	*Ceanothus otayensis*	Otay Mountain ceanothus	None	None		1B.2
302	San Diego	PDROS0W045	*Horkelia cuneata ssp. puberula*	mesa horkelia	None	None		1B.1
303	San Diego	PDROS0W0G0	*Horkelia truncata*	Ramona horkelia	None	None		1B.3
304	San Diego	PDROS1J1B0	*Rosa minutifolia*	small-leaved rose	None	Endangered		2.1
305	San Diego	PDROS1K2N1	*Rubus glaucifolius var. ganderi*	Cuyamaca raspberry	None	None		1B.3
306	San Diego	PDRUB0N042	*Galium angustifolium ssp. borregoense*	Borrego bedstraw	None	Rare		1B.3
307	San Diego	PDRUB0N04C	*Galium angustifolium ssp. jacinticum*	San Jacinto Mountains bedstraw	None	None		1B.3
308	San Diego	PDRUB0N1V0	*Galium proliferum*	desert bedstraw	None	None		2.2
309	San Diego	PDSAX0E050	*Heuchera brevistaminea*	Laguna Mountains alumroot	None	None		1B.3
310	San Diego	PDSAX0E106	*Heuchera rubescens var. versicolor*	San Diego County alumroot	None	None		2.3
311	San Diego	PDSCR0J0C2	*Chloropyron maritimum ssp. maritimum*	salt marsh bird's-beak	Endangered	Endangered		1B.2
312	San Diego	PDSCR0J0G0	*Dicranostegia orcuttiana*	Orcutt's bird's-beak	None	None		2.1
313	San Diego	PDSCR1U010	*Stemodia durantifolia*	purple stemodia	None	None		2.1
314	San Diego	PDSOL0G0D0	*Lycium parishii*	Parish's desert-thorn	None	None		2.3
315	San Diego	PDSTE01020	*Ayenia compacta*	California ayenia	None	None		2.3
316	San Diego	PDSTE03020	*Fremontodendron mexicanum*	Mexican flannelbush	Endangered	Rare		1B.1
317	San Diego	PGCUP040B0	*Hesperocyparis stephensonii*	Cuyamaca cypress	None	None		1B.1
318	San Diego	PGCUP040C0	*Hesperocyparis forbesii*	Tecate cypress	None	None		1B.1
319	San Diego	PGPIN04152	*Pinus torreyana ssp. torreyana*	torrey pine	None	None		1B.2
320	San Diego	PMAGA010P0	*Agave shawii*	Shaw's agave	None	None		2.1
321	San Diego	PMAGA08070	*Nolina interrata*	Dehesa nolina	None	Endangered		1B.1
322	San Diego	PMAGA080E0	*Nolina cismontana*	chaparral nolina	None	None		1B.2
323	San Diego	PMJUN013J0	*Juncus luciensis*	Santa Lucia dwarf rush	None	None		1B.2
324	San Diego	PMLIL0C050	*Brodiaea filifolia*	thread-leaved brodiaea	Threatened	Endangered		1B.1
325	San Diego	PMLIL0C0B0	*Brodiaea orcuttii*	Orcutt's brodiaea	None	None		1B.1
326	San Diego	PMLIL0D0C0	*Calochortus dunnii*	Dunn's mariposa-lily	None	Rare		1B.2
327	San Diego	PMLIL1A0J0	*Lilium parryi*	lemon lily	None	None		1B.2
328	San Diego	PMLIL1H010	*Bloomeria clevelandii*	San Diego goldenstar	None	None		1B.1
329	San Diego	PMPOA27050	*Digitaria californica*	Arizona cottontop	None	None		2.3
330	San Diego	PMPOA48020	*Muhlenbergia appressa*	appressed muhly	None	None		2.2
331	San Diego	PMPOA4G010	*Orcuttia californica*	California Orcutt grass	Endangered	Endangered		1B.1
332	San Diego	PMPOA4Z0A0	*Poa atropurpurea*	San Bernardino blue grass	Endangered	None		1B.2
333	San Diego	PMPOA5T030	*Sphenopholis obtusata*	prairie wedge grass	None	None		2.2
334	San Diego	PPSEL010G0	*Selaginella eremophila*	desert spike-moss	None	None		2.2

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