## 3.4 BIOLOGICAL RESOURCES

| **BIOLOGICAL RESOURCES** – Would the Project: | **Potentially Significant Impact** | **Less Than Significant with Mitigation** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☒ |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☒ | ☐ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☒ | ☐ | ☐ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

### 3.4.1 Environmental Setting

#### 3.4.1.1 Terrestrial Environment and Biology

Historically, the onshore portion of the Project area supported coastal salt marsh, but was converted to residential and industrial uses, including electric generation at the EPS which began operation in the City of Carlsbad in 1954. The following discussion of biological resources at the EPS is taken from the Final Staff Assessment for the Carlsbad Energy Center Project (CECP), which included a biological resources survey of the entire 95-acre EPS in 2003 and a 2007 reconnaissance-level survey of the CECP

site (approximately 1,000 feet east-northeast of the onshore fuel oil submarine pipeline) and a 1-mile buffer.

*The CECP site is highly disturbed and/or developed due to ongoing operations within the existing Encina Power Station. The majority of the CECP footprint is composed of bare ground or a combination of bare ground and gravel with scattered ruderal vegetation. Plant species observed include iceplant (Carpobrotus edulis), tocalote (Centaurea melitensis), horseweed (Conyza sp.), black mustard (Brassica nigra), fountain grass (Pennisetum setaceum), wild oat (Avena fatua), foxtail chess (Bromus madritensis ssp. rubens), tree tobacco (Nicotiana glauca), western marsh-rosemary (Limonium californicum), salt heliotrope (Heliotropium curasavicum), buckwheat (Eriogonum sp.), and cudweed (Gnaphalium sp.). Eucalyptus (Eucalyptus sp.) plantings occur along the northern and eastern perimeter of the CECP site and serve as visual screens of the Encina Power Station. These plantings are mature eucalyptus trees greater than 45 feet in height and of sufficient canopy cover to potentially support nesting raptors.*

*Due to the frequency and intensity of disturbance from operation of the Encina Power Station, the proposed CECP site does not provide habitat capable of supporting a diverse assemblage of wildlife. Direct wildlife observations in the project area include common species such as California ground squirrel (Spermophilus beecheyi) and a variety of bird species typically found in disturbed and developed areas such as house finch (Carpodacus mexicanus), northern mockingbird (Mimus polyglottus), mourning dove (Zenaida macroura), rock dove (Columba livia), European starling (Sturnus vulgaris), house sparrow (Passer domesticus), and American crow (Corvus branchyrhynchos). Additional common bird species observed within the proposed CECP site include Anna's hummingbird (Calypte anna), black phoebe (Sayornis nigricans), common yellowthroat (Geothlypis trichas), and California towhee (Pipilo crissalis).*

**Vegetation**

The fuel oil submarine pipeline corridor does not support terrestrial vegetation; however, vegetation is present on Carlsbad State Beach between the surf zone and Carlsbad Boulevard south of the pipeline corridor. Vegetation present in this area includes native shrub species; these species are isolated from the beach by a concrete retaining wall.

**Sensitive Habitats**

The Agua Hedionda Lagoon (outer lagoon) is located approximately 300 feet north of the fuel oil submarine pipeline corridor and is the source of cooling water for the EPS. The lagoon has been dredged periodically to ensure adequate flow to the cooling water inlet since 1954. The Lagoon supports special-status species such as the southwestern

pond turtle (*Actinemys marmorata*), white-faced ibis (*Plegadis chihi*), and western snowy plover (*Charadrius alexandrinus nivosus*) and provides foraging habitat for American peregrine falcon (*Falco peregrinus anatum*) and osprey (*Pandion haliaetus*). The estuarine and marsh habitat surrounding the lagoon provides suitable nesting habitat for special-status species such as the California least tern (*Sterna antillarum browni*), elegant tern (*Sterna elegans*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), California brown pelican (*Pelecanus occidentalis*), and coastal California gnatcatcher (*Polioptila californica californica*).

The EPS (including onshore portions of the MOT) is located within the boundary of the City of Carlsbad's (2004) Habitat Management Plan (HMP), which guides local implementation for the North County Multiple Habitat Conservation Program (MHCP) (SANDAG 2003). The MHCP focuses on habitat preservation and enhancement for the coastal California gnatcatcher, and designated Agua Hedionda Lagoon and adjacent areas to the east as core habitat area. Critical habitat for the coastal California gnatcatcher was finalized on December 19, 2007, but excluded habitat areas immediately east of Agua Hedionda Lagoon as they are protected under the MHCP.

**Special Status Species**

Based on reviews of the California Natural Diversity Database, City of Carlsbad's HMP, and other environmental documents prepared for projects in the area, several special status species have the potential to occur in the vicinity of the EPS (Table 3.4-1).

**Table 3.4-1. Special Status Species that May Occur in EPS Vicinity**

| Species | Category |
|---|---|
| California adolphia (*Adolphia californica*) | CNPS List 2 |
| Coast woolly-head (*Nemacaulis denudata var. denudata*) | CNPS List 1B |
| Cliff spurge (*Euphorbia misera*) | CNPS List 2 |
| Orcutt's pincushion (*Chaenactis glabriuscula ssp. orcuttiana*) | CNPS List 1B |
| South Coast saltscale (*Atriplex pacifica*) | CNPS List 1B |
| Wart-stemmed ceanothus (*Ceanothus verrucosus*) | CNPS List 2 |
| Saltmarsh skipper butterfly (*Panoquina errans*) | Special Animal |
| San Diego fairy shrimp (*Branchinecta sandiegonensis*) | FE |
| Tidewater goby (*Eucyclogobius newberryi*) | FE; CSC |
| Southwestern pond turtle (*Actinemys marmorata*) | CSC |
| American peregrine falcon (*Falco peregrinus anatum*) | FP |
| Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) | SE |
| California brown pelican (*Pelecanus occidentalis californicus*) | FP |
| California least tern (*Sterna antillarum browni*) | FE; SE; FP |
| Coastal California gnatcatcher (*Polioptila californica* | FT; CSC |
| Cooper's hawk (*Accipiter cooperi*) | WL |
| Elegant tern (*Sterna elegans*) | WL |
| Light-footed clapper rail (*Rallus longirostris levipes*) | FE; SE; FP |

**Table 3.4-1. Special Status Species that May Occur in EPS Vicinity**

| Species | Category |
|---|---|
| Osprey (*Pandion haliaetus*) | WL |
| Western snowy plover (*Charadrius alexandrinus nivosus*) | FT; CSC |
| White-faced ibis (*Plegadis chihi*) | WL |
| Pocketed free-tailed bat (*Nyctinomops femorosaccus*) | CSC |

Acronyms: CNPS = California Native Plant Society; CSC = California Species of Special Concern; FE = Federally Endangered; FP = Fully Protected; SE = State Endangered; WL = Watch List.

Most of the special-status species listed above have been reported in MHCP core habitat areas, including Core #4 which includes Agua Hedionda Lagoon. The EPS, including the onshore fuel oil submarine pipeline corridor, does not provide suitable habitat for these species; however, a 1959 California Natural Diversity Database entry reports that coast woolly-heads (*Nemacaulis denudata var. denudate*) were found on the sandy beach near the EPS. It is unknown if this species has been found there recently. In addition, the 2007 Western Snowy Plover Recovery Plan indicates that snowy plovers bred along the shore of Agua Hedionda Lagoon prior to 2000, but have not been found breeding at Carlsbad State Beach since. It is possible that the western snowy plover may forage along Carlsbad State Beach during the non-breeding season (September to February).

#### 3.4.1.2 Marine Environment and Biology

The offshore area adjacent to the EPS is located within the larger biogeographic zone known as the Southern California Bight (SCB), which encompasses approximately 22,000 square miles with boundaries that span from Point Conception, California, in the north to Cabo Colnett, Baja California, in the south. The SCB has a high upwelling index, (upward flowing current) between April and August, but geostrophic or wind-driven flows may occur year round (City of Carlsbad 2005).

Descriptions of intertidal and subtidal habitats and biota provided below were derived mainly from existing literature dated prior to 2005, and supplemented and updated by information collected during a Project-specific biological resources survey performed by Merkel & Associates (2013a). A copy of the Merkel & Associates survey report is provided in Appendix I.

**Intertidal Habitats and Biota**

The beach habitat in the Project vicinity consists mainly of wave-swept sandy shores. Sand cover on the beaches and in the nearshore varies seasonally. In the winter, intertidal sand is transported offshore and the underlying cobble is exposed. Additionally, riprap is present on the sand beach within the Project area, and covers the intertidal portion of the fuel oil submarine pipeline.

Species common to the sandy beach include: air-breathing pill bugs (*Alloniscus perconvexus*), an isopod (*Tylos punctatus*), the amphipod beach hopper (*Orchestoidea californiana*), the mole crab (*Emerita analoga*), the opossum (*mysid*) shrimp (*Archaeomysis maculata*), the polychaete worm (*Euzonus mucronata*), the bean clam (*Donax gouldi*), and the Pismo clam (*Tivela stultorum*) (City of Carlsbad 2005).

The California grunion (*Leuresthes tenuis*) is also a species common to the Project area, with a range that extends from Point Conception, California, to Point Abreojos, Baja California. Although this species inhabits nearshore waters (from the surf to a depth of 60 feet), they leave the water at night to spawn on beaches during the spring and summer months. For four consecutive nights, beginning on the nights of the full and new moons, spawning occurs after high tides and continues for several hours. Spawning occurs from March through August and occasionally in February and September, with peak spawning occurring from late March to early June. In 1927, regulations were instituted that mandated a closed season for 3 months, from April through June. In 1947, species abundance had improved and the closure was shortened to April through May. This closure is still in effect to protect grunion during their peak spawning period (CDFW 2014).

Except for the manmade riprap, the closest rocky intertidal habitat is located about 3,250 feet down coast (south) of the EPS discharge channel (the area between the southern set of double jetties across from the Aqua Hedionda Lagoon), which is located approximately 2,950 feet south of the riprap covering the fuel oil submarine pipeline. Although a list of biota associated with that rocky intertidal habitat was not found, studies on the north and south riprap jetties at the mouth of Agua Hedionda Lagoon found species typical of southern California rocky intertidal habitats. Surf grass (*Phyllospadix spp.*) was also observed on the north jetty riprap and on rock reefs offshore of the EPS in water depths of 20 feet or less (Le Page and Ware 2001).

**Subtidal Habitats and Biota**

The sedimentary habitat continues offshore along the fuel oil submarine pipeline corridor, however, rocky subtidal substrate to the north and south support kelp and other macroalgae (City of Carlsbad 2005). Species listed by EA Engineering, Science, and Technology (1997, cited in City of Carlsbad 2005) as associated with the subtidal sand habitat within the vicinity of the EPS include: a polychaete (*Prionospio pygmaeus*), a proboscis worm (*Carinoma mutabilis*), a sea spider (*pycnogonid*) (*Callipallene californiensis*), two crustaceans (*Megaluropus sp.* and *Leptocuma forsmani*), and the sand dollar (*Dendraster excentricus*). Le Page and Ware (2001) completed a series of spot dives offshore of the EPS and report a sedimentary (sand) bottom with the tube-building worm *Diopatra sp*. present in approximately 18 feet of water at the two locations closest to the existing fuel oil submarine pipeline.

The City of Carlsbad (2005) reports that fish associated with the sedimentary habitat within the vicinity of the Project area include the speckled sanddab (*Citharichthys stigmaeus*), northern anchovy (*Engraulis mordax*), queenfish (*Seriphus politus*), sand bass (*Paralabrax nebulifer*), white croaker (*Genyonemus lineatus*), horneyhead turbot (*Pleuronichthys verticalis*), and California halibut (*Paralichthys californicus*). No eelgrass was reported within the subtidal sedimentary habitat.

Several sources of information document the location of rocky substrate and kelp in the immediate Project area. Those sources include the City of Carlsbad Final EIR Precise Development Plan and Desalination Project (City of Carlsbad 2005); the San Diego and Orange County Region Nine Kelp Survey Consortium (reporting kelp conditions in 2011) (MBC Applied Environmental Sciences 2012); the Encina Power Station Marine Biological Resources Survey (reporting hard bottom and kelp conditions) (Merkel & Associates 2013a); and the Cabrillo Power I LLC Encina Power Station Bathymetry and Geophysical Survey (Fugro Pelagos, Inc. [Fugro] 2013) (documenting hard bottom and kelp coverage). The findings from each source are discussed below.

As described in the City of Carlsbad Final EIR Precise Development Plan and Desalination Project (City of Carlsbad 2005), the offshore and northward extension of the intertidal rocky substrate south of the fuel oil submarine pipeline supports a relatively large kelp bed; a smaller and seasonal kelp bed associated with the other rock habitat within the Project area is located approximately 3,600 feet to the north of the riprap covering the pipeline.

The San Diego and Orange County Region Nine Kelp Survey Consortium states that kelp bed size and health varies considerably from year to year depending on a variety of environmental factors including available light, sedimentation, nutrient pulses, grazing by herbivores, storms, and the El Niño Southern Oscillation. The kelp canopy coverage immediately offshore of the EPS, as measured between the years 1967 and 2011, varied from 0 to just under 0.4 square kilometers, with the greatest coverage observed in 2008. The average bed area per year for this kelp bed mirrored the other beds in the San Diego region from 1967 through 2011, either generally reacting favorably or negatively with large stimuli such as the La Niña and El Niño Southern Oscillations. Figure 3.4-1 shows kelp coverage in the Project area as of December 2011 as reported in the Status of the Kelp Beds 2011 for the San Diego and Orange County Region Nine Kelp Survey Consortium (MBC Applied Environmental Sciences 2012).

In their biological resources survey report (Appendix I), Merkel & Associates (2013a) also identified the location of hard bottom and kelp in the Project area (Figure 3.4-2). Their findings match those of Fugro's bathymetric and geophysical survey map (April 2013) with the exception that some areas at the southern limits of Fugro's survey map are identified as kelp whereas Merkel & Associates identified these areas as bedrock.

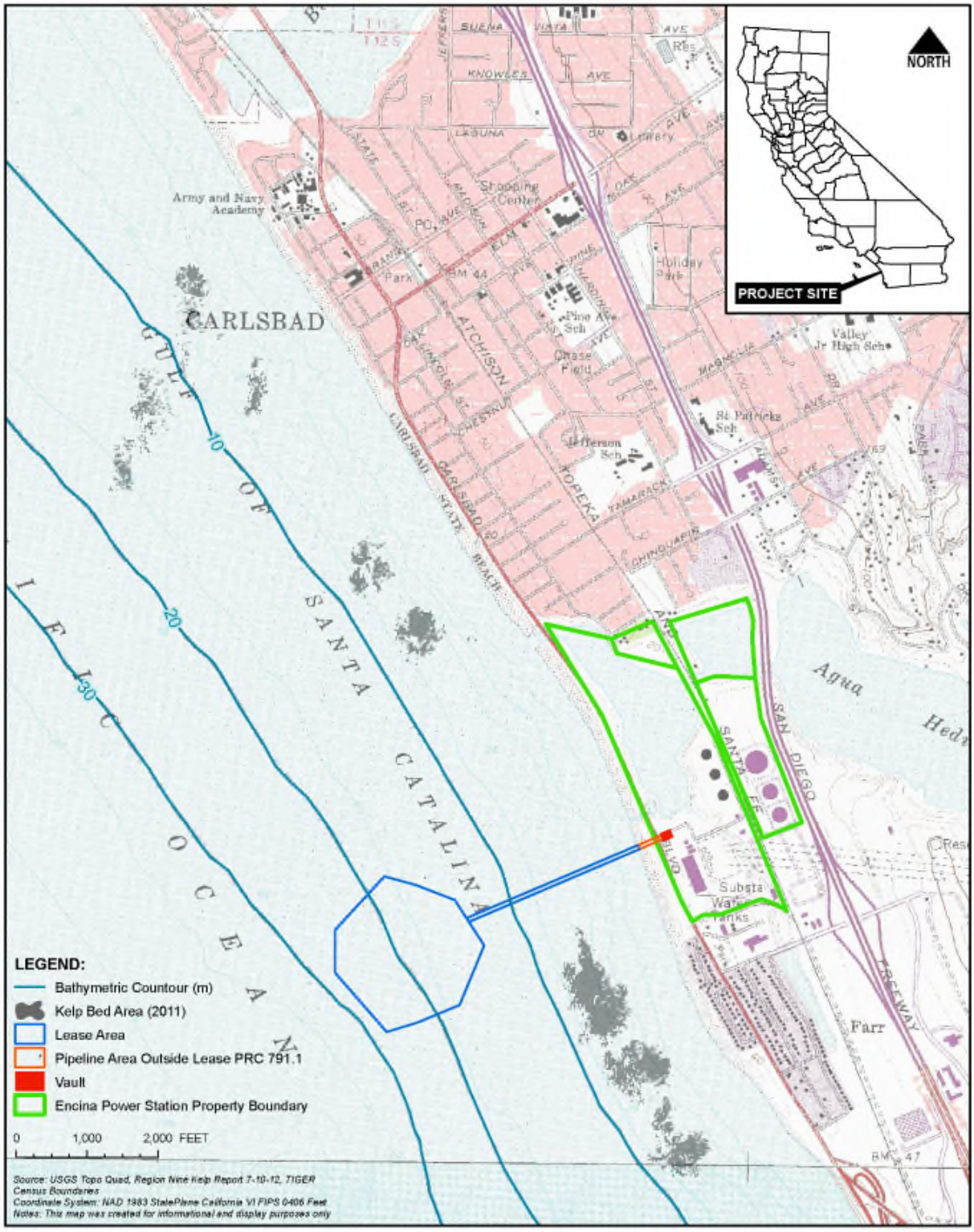


**Figure 3.4-1. Project Area Kelp Coverage (2011)**

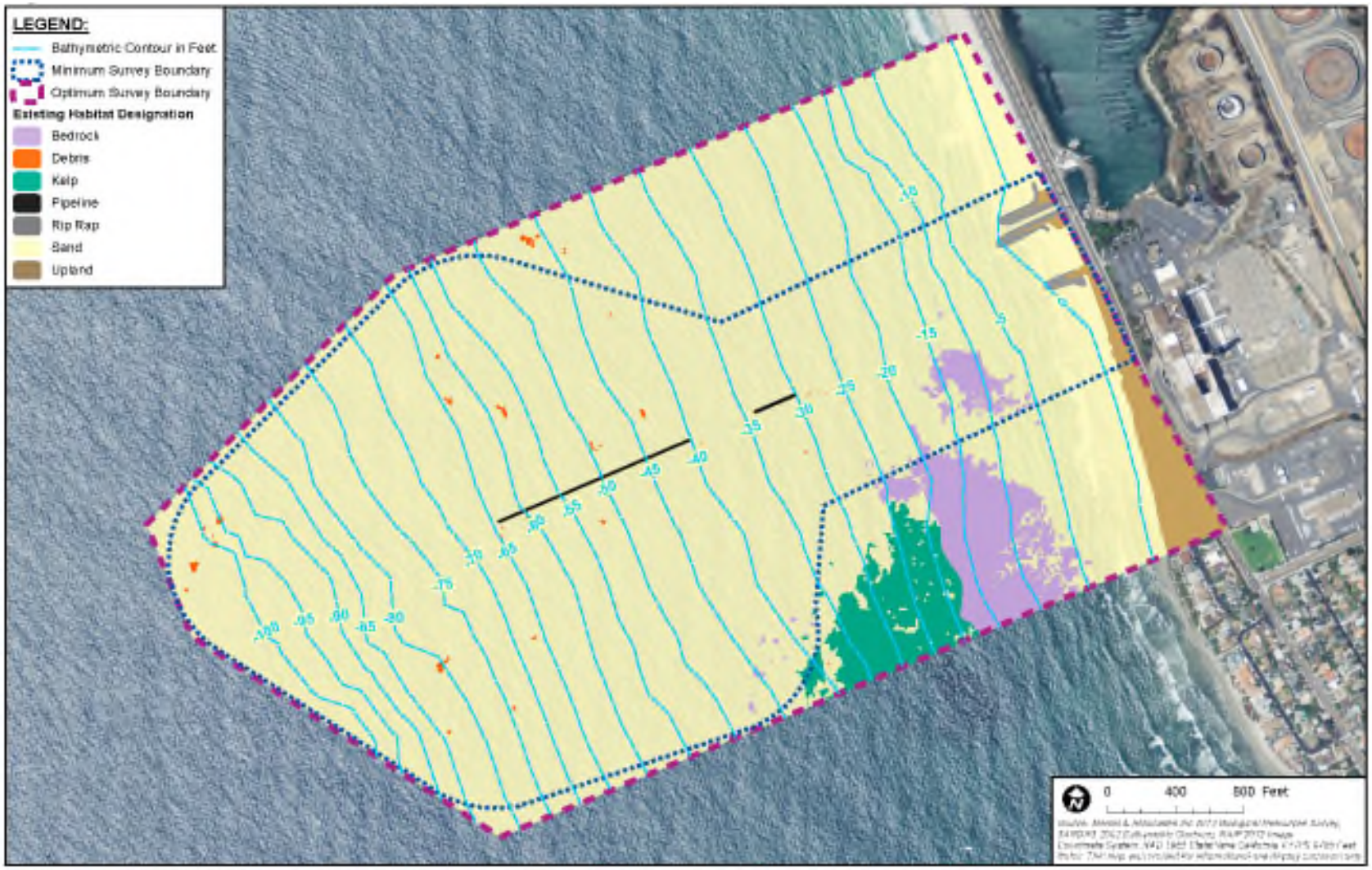


**Figure 3.4-2. Marine Habitats in the Vicinity of the EPS**

The bathymetry and surficial features (kelp and hard bottom) as mapped by Fugro is used as the base for the Project Site Map (Figure A1-1 in Appendix A).

Macrophytic brown algal taxa recorded within the rocky seafloor habitats offshore of the EPS and within the kelp bed north of the Project site include the southern sea palm (*Eisenia arborea*), feather boa kelp (*Egregia laevigata*), oar weed (*Laminaria farlowii*), and bladder chain kelp (*Cystoseira osmundacea*). Understory "turf algae," including *Dictyota flabellata* and *Rhodymenia californica*, have also been recorded within these kelp beds (City of Carlsbad 2005; Le Page and Ware 2001).

Kelp bed-associated epifauna (attached organisms) reported within the Project region include invertebrates; the dominant species is the tube-building polychaete (*Diopatra ornata*), but other species present include sea fans (*Muricea californica* and *M. fructicosa*), a sea anemone (*Anthopleura elegantissima*), a tunicate (*Styela montereyensis*), the dog or Kellet's whelk (*Kelletia kelletii*), and sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*). Encrusting species such as bryozoans, other tunicates, sponges, and hydrozoans are also abundant (EA Engineering, Science and Technology 1997 [as cited in City of Carlsbad 2005]; Le Page and Ware 2001).

Several surveys cited in City of Carlsbad (2005) document the presence of fish species associated with the kelp beds in the Project area, including kelp bass (*Paralabrax clathratus*), sand bass (*P. nebulifer*), black surfperch (*Embiotoca jacksoni*), kelp surfperch (*Brachyistius frenatus*), white surfperch (*Phaenerodon furcatus*), black surfperch (*Embiotoca jacksoni*), California sheephead (*Semicossyphus pulcher*), rock wrasse (*Halichoeres semicinctus*), senorita (*Oxyjulis californica*), and topsmelt (*Atherinops affinis*).

**Offshore Seafloor Habitat and Biota**

A seafloor habitat mapping study using a side-scan sonar and ROV was completed offshore the EPS in February 2013 in water depths ranging from approximately 10 to 120 feet mean lower low water (Merkel & Associates 2013a). Figure 3.4-2 shows the survey area and a copy of the survey report is provided as Appendix I.

Sonar data were used to develop a seafloor habitat map and ground-truthing of the interpreted habitats was completed using the ROV. Merkel & Associates (2013a) reports that sedimentary habitat comprised 350 of the 387 acre survey area; the surficial sediments consisted of fine sand throughout the survey area. Hard bottom habitat, consisting of rock reefs, comprises the remaining 27 acres (7% of the survey area) as shown in Figure 3.4-2. Along the southern boundary of the survey area, approximately 15 acres of bedrock reef habitat was recorded. Hard bottom substrate is present in

water depths ranging from -5 to -20 feet, with a small patch located approximately 100 feet south of the fuel oil submarine pipeline corridor (Merkel & Associates 2013a).

During the February survey, biologists were not able to detect surfgrass beds due to an inability to access the shallow waters over the reef features. Merkel & Associates (2013a) does, however, indicate that surfgrass on these reefs cannot be ruled out and have been previously observed in this area. Surfgrass may also be present on the top of the reef at the southeastern portion of the study area (Merkel & Associates 2013a).

Kelp beds documented in this survey are dominated by giant kelp (*Macrocystis pyrifera*), which ranges from water depths of about -20 feet to -120 feet. Approximately 12 acres of kelp forest habitat was present along the southern boundary of the Merkel & Associates' study area in water depths ranging from -20 to -45 feet.

In their report, Merkel & Associates (2013a) noted several species associated with sedimentary habitat within the Project area at various water depths. At a water depth of -25 feet, a sea pen (*Stylatula elongata*) and thornback ray (*Platyrhinoidis triseriata*) were recorded. In water depths up to 45 feet, Ichthyofauna species were found, including the Dover sole (*Microstomus pacificus*), longspine combfish (*Zaniolepis latipinnis*), Pacific sanddab (*Citharichthys sordidus*), speckled sanddab (*C. stigmaeus*), and unidentified rockfish (*Sebastes spp*.). In water depths between 45 and 75 feet, the black-eyed goby (*Coryphopterus nicholsii*) and California lizardfish (*Synodus lucioceps*) were observed.

A variety of targets were detected from the sonar survey, including two exposed sections of the fuel oil submarine pipeline:

- A 150-foot-long section, found at water depths ranging from 30 to 35 feet; and
- A 1,100-feet-long section, found between the 40-foot and 63-foot isobaths.

The relatively low relief of the fuel oil submarine pipeline and the adjacent sandy habitat suggest that the pipeline is intermittently buried and exposed and is, therefore, unlikely to support a diverse community of perennial marine organisms (Merkel & Associates 2013a). No kelp or other epibiota were observed on the exposed portions of pipeline.

The sonar survey also detected anchors and chain, which support some epibiota, including tunicates, bryozoans, sponges, sea fans (*Muricea spp.*), and turf red algae (*Corallina spp.*), but few perennial macroalgal species and no canopy-forming macrophytic algae. Two juvenile lobsters (*Panulirus interruptus*) and a black-eyed goby were observed adjacent to one exposed anchor chain. Smaller isolated targets detected by the sonar survey were also investigated. Most were biological, consisting of organic material such as shells that had likely fallen off or had been scraped off of the surface moorings. The debris piles typically consisted of mounds of mussel shells (*Mytilus spp*.),

which supported a number of small crustaceans, including unidentified crab and shrimp species, and occasionally squid eggs (Merkel & Associates 2013a).

**Sea Turtles**

Sea turtles that may be found in the Project area include the leatherback sea turtle (*Dermachelys coriacea*) and loggerhead sea turtle (*Caretta caretta*), both of which are federally endangered species, and the green sea turtle (*Chelonia mydas*) and olive ridley sea turtle *(Lepidochelys olivacea*), which are listed as Federally threatened species. Additional information on these sea turtles and their status is provided in the Project-specific Marine Wildlife Contingency Plan (MWCP) (Appendix F).

**Marine Mammals**

The area in and around the Project site supports local populations of marine mammals, including bottlenose dolphins (*Tursiops truncatus truncatus*) (offshore and coastal species), California sea lions (*Zalophus californianus*), and Pacific harbor seals (*Phoca vitulina richardsi*). The California gray whale (*Eschrichtius robustus*) may also be present in the Project area as it migrates from Baja California to Alaska. Based on abundance and zoogeographic distribution information, marine wildlife most likely to be encountered by vessels during transit include the common dolphin (*Delphinus delphis*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), bottlenose dolphin, California sea lion, Pacific harbor seal, southern sea otter (*Enhydra lutris nereis*), and California gray whale. All marine mammal species are fully protected under the Marine Mammal Protection Act (MMPA), with additional protection to endangered and threatened species under the Federal Endangered Species Act (FESA) and California Endangered Species Act. The only endangered or threatened marine mammal species expected to occur in and around the Project site is the southern sea otter, which is considered a threatened species under the FESA. Additional information on the biology of these and other marine wildlife is provided in the Project-specific MWCP (Appendix F).

**Non-Native Aquatic Species**

Non-native aquatic species (NAS), also known as non-indigenous aquatic species, include plants, animals, and micro-organisms that have been introduced or transported to new regions through various human activities. In coastal environments, commercial shipping is the most significant vector for invasions, and vessel biofouling and ballast water are considered the primary contributors of NAS. Once established, NAS can cause significant ecological, economic, and human health problems in the receiving environment, including altering the structure and function of ecosystems, causing declines in native and commercial fisheries, and spreading human pathogens. The California Department of Fish and Wildlife (CDFW) (formally California Department of Fish and Game [CDFG]) recognizes 347 NAS with established populations in California

coastal waters (CDFW Office of Spill Prevention and Response [OSPR] 2014). The origin of many NAS is unknown; however, the majority of NAS in California appear to be native to the northwest Pacific or northeast Atlantic.

The CSLC is the lead implementing agency for the State's Marine Invasive Species Program (MISP), which strives to prevent NAS release from commercial vessels to California waters. The MISP began in 1999 with the passage of California's Ballast Water Management for Control of Nonindigenous Species Act, which addressed the threat of NAS introductions through ships' ballast water. In 2003, the Marine Invasive Species Act (MISA) was passed, reauthorizing and expanding the 1999 Act, which directed the CSLC to formulate recommendations to prevent or minimize the introduction of NAS discharges for vessels 300 gross registered tons or greater, capable of carrying ballast water, operating in State waters. All vessels that depart a California port or place are required to submit to the CSLC a Ballast Water Reporting Form that includes information about port of origin, how the ballast water was managed, and how much ballast water was discharged (CSLC 2014).

The CSLC also regulates vessel biofouling under the MISA. Since 2008, the CSLC has required vessels subject to the MISA to submit an annual Hull Husbandry Reporting Form, and regularly remove vessel biofouling. These data, in conjunction with results from CSLC-funded biological research, help in the identification of management practices to reduce the risk of NAS introductions through vessel biofouling. The CSLC has proposed regulations (specifically to amend Cal. Code Regs., tit. 2, div. 3, ch. 1, art. 4.8) that would establish management requirements for vessel biofouling, including the use of a biofouling management plan specific to the vessel, biofouling log book, and use of antifouling systems or practices to deter or prevent species attachment.

### 3.4.2 Regulatory Setting

#### 3.4.2.1 Federal and State

Federal and State laws and regulations pertaining to this issue area and relevant to the Project are identified in Table 3.4-2.

**Table 3.4-2. Laws, Regulations, and Policies (Biological Resources)**

| | | |
|---|---|---|
| **U.S.** | Endangered Species Act (FESA) (7 USC 136, 16 USC 1531 et seq.) | The FESA, which is administered in California by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), provides protection to species listed as threatened or endangered, or proposed for listing as threatened or endangered. Section 9 prohibits the "take" of any member of a listed species.<br>• Take is defined as "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<br>• Harass is "an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited |

## Table 3.4-2. Laws, Regulations, and Policies (Biological Resources)

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|---|---|---|
| | | to, breeding, feeding, or sheltering."<br>• Harm is defined as "...significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering."<br>When applicants are proposing projects with a Federal nexus that "may affect" a federally listed or proposed species, the Federal agency is required to consult with the USFWS or NMFS, as appropriate, under Section 7, which provides that each Federal agency must ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat. |
| **U.S.** | Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 et seq.) | The MSA is the primary law governing marine fisheries management in U.S. Federal waters. The MSA was first enacted in 1976 and amended in 1996. Amendments to the 1996 MSA require the identification of Essential Fish Habitat (EFH) for federally managed species and the implementation of measures to conserve and enhance this habitat. Any project requiring Federal authorization, such as a USACE permit, is required to complete and submit an EFH Assessment with the application and either show that no significant impacts to the essential habitat of managed species are expected or identify mitigations to reduce those impacts. Under the MSA, Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802(10)). The EFH provisions of the MSA offer resource managers a means to heighten consideration of fish habitat in resource management. Pursuant to section 305(b)(2), Federal agencies shall consult with the NMFS regarding any action they authorize, fund, or undertake that might adversely affect EFH. |
| **U.S.** | Marine Mammal Protection Act (MMPA) (16 USC 1361 et seq.) | The MMPA is designed to protect and conserve marine mammals and their habitats. It prohibits takes of all marine mammals in the U.S. with few exceptions. The NMFS may issue a take permit under section 104 if the activities are consistent with the purposes of the MMPA and applicable regulations at 50 CFR, Part 216. The NMFS must also find that the manner of taking is "humane" as defined in the MMPA. If lethal taking of a marine mammal is requested, the applicant must demonstrate that using a non-lethal method is not feasible. |
| **U.S.** | Migratory Bird Treaty Act (MBTA) (16 USC 703-712) | The MBTA was enacted to ensure the protection of shared migratory bird resources. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit. The responsibilities of Federal agencies to protect migratory birds are set forth in Executive Order (EO) 13186. The USFWS is the lead agency for migratory birds. The USFWS issues permits for takes of migratory birds for activities such as scientific research, education, and depredation control, but does not issue permits for incidental take of migratory birds. |
| **U.S.** | Other | • The Bald and Golden Eagle Protection Act makes it illegal to import, export, take (including molest or disturb), sell, purchase or barter any bald eagle or golden eagle or parts thereof.<br>• Clean Water Act (33 USC 1251 et seq.) and Rivers and Harbors Act (33 USC 401) *(see Section 3.9, Hydrology and Water Quality).*<br>• CZMA *(see Table 1-2).*<br>• EO 13112 requires Federal agencies to use authorities to prevent introduction of invasive species, respond to and control invasions in a cost-effective and environmentally sound manner, and provide for restoration of native species and habitat conditions in invaded ecosystems.<br>• EO 13158 requires Federal agencies to identify actions that affect natural or cultural resources within a Marine Protected Area (MPA) and, in taking such |

## Table 3.4-2. Laws, Regulations, and Policies (Biological Resources)

| | | |
|---|---|---|
| | | actions, to avoid harm to the natural and cultural resources that are protected by a MPA. |
| **CA** | California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.) | The CESA provides for the protection of rare, threatened, and endangered plants and animals recognized by the California Department of Fish and Wildlife (CDFW), and prohibits the taking of such species without its authorization; CESA also provides protection for species designated as candidates for threatened or endangered listings. Under the CESA, the CDFW has the responsibility for maintaining a list of threatened species and endangered species (Fish & G. Code, § 2070). The CDFW also maintains a list of candidate species, which are species that the CDFW has formally noticed as under review for addition to the threatened or endangered species lists. The CDFW also maintains lists of Species of Special Concern that serve as watch lists. Pursuant to the requirements of the CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project site and determine whether the proposed project will have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any proposed project that may affect a candidate species. The CESA also requires a permit to take a State-listed species through incidental or otherwise lawful activities (§ 2081, subd. (b)). |
| **CA** | California Marine Life Protection Act (MLPA) (Fish & G. Code, §§ 2850–2863) | Passed by the State Legislature in 1999, the MLPA required the CDFW to redesign its system of MPAs to increase its coherence and effectiveness at protecting the state's marine life, habitats, and ecosystems. For the purposes of MPA planning, a public-private partnership commonly referred to as the MLPA Initiative was established, and the State was split into five distinct regions (four coastal and the San Francisco Bay) each of which had its own MPA planning process. All four coastal regions have completed these individual planning processes. As a result the coastal portion of California's MPA network is now in effect statewide. Options for a planning process in the San Francisco Bay have been developed for consideration at a future date. |
| **CA** | Lake and Streambed Alteration Program (Fish & G. Code, §§ 1600-1616) | The CDFW regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. These regulations require notification of the CDFW for lake or stream alteration activities. If, after notification is complete, the CDFW determines that the activity may substantially adversely affect an existing fish and wildlife resource, the CDFW has authority to issue a Streambed Alteration Agreement. |
| **CA** | Other relevant California Fish and Game Code sections | • The California Native Plant Protection Act (Fish & G. Code, § 1900 et seq.) is intended to preserve, protect, and enhance endangered or rare native plants in California. This Act includes provisions that prohibit the taking of listed rare or endangered plants from the wild and a salvage requirement for landowners. The Act directs the CDFW to establish criteria for determining what native plants are rare or endangered. Under section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered.<br>• The California Species Preservation Act (Fish & G. Code, §§ 900-903) provides for the protection and enhancement of the amphibians, birds, fish, mammals, and reptiles of California.<br>• Fish and Game Code sections 3503 & 3503.5 prohibit the taking and possession of native birds' nests and eggs from all forms of needless take. These regulations also provide that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nests or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto. |

**Table 3.4-2. Laws, Regulations, and Policies (Biological Resources)**

| | | |
|---|---|---|
| | | • Fish and Game Code sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), & 5515 (fish) designate certain species as "fully protected." Fully protected species, or parts thereof, may not be taken or possessed at any time without permission by the CDFW.<br>• Fish and Game Code section 3513 does not include statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game, migratory birds. |
| **CA** | Coastal Act Chapter 3 policies (see also Table 1-2) | Coastal Act policies applicable to this issue area are:<br>• Section 30230 states: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.<br>• Section 30231 addresses biological productivity and water quality.<br>• Section 30233, which applies in part to development activities within or affecting wetlands and other sensitive areas among other requirements, identifies eight allowable uses, requires that the proposed project be the least environmentally damaging feasible alternative, and where applicable, requires feasible and appropriate mitigation.<br>• Section 30240 states: (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.<br>(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas. |

### 3.4.4.2 Local

The City of Carlsbad (2006) General Plan OSCE contains the following biological resources-related goals, objective, and policy relevant to onshore Project activities.

- Goal A.1: A city that protects environmentally sensitive land and buffer areas.
- Goal A.7: A city which makes every possible effort to preserve sensitive flora and fauna.
- Objective B.12: To ensure that whenever possible, new development does not adversely impact sensitive environmental resources.
- Policy C.19: Preserve natural resources by: protecting fish, wildlife, and vegetation habitats; retaining the natural character of waterways, shoreline features, hillsides, and scenic areas and viewpoints; safeguarding areas for scientific and educational research; respecting the limitations for air and water resources to absorb pollution; encouraging legislation that will assist logically in preserving these resources and, protecting archeological and paleontological resources.

### 3.4.3 Impact Analysis

***a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

Terrestrial Biology

**Less than Significant Impact.** Decommissioning and abandonment activities on land would mostly be limited to developed areas (mostly paved) within the EPS, the fuel oil submarine pipeline corridor under Carlsbad Boulevard, and the beach. While several special-status species have been reported in MHCP core habitat areas, the EPS and onshore pipeline corridor do not provide suitable habitat for these species; however, two species have been reported in the Project's vicinity: the coast woolly-head and western snowy plover.

A 1959 entry in the California Natural Diversity Database reports that coast woolly-heads were found on the beach near the EPS; however, due to scouring/deposition by tides and storm waves, no suitable habitat for this species is apparent on the beach; therefore, there would be no loss of suitable habitat for coast woolly-head. As a result, it is unlikely that the Project would have a substantial adverse effect on the coast woolly-head, and this impact would be less than significant.

The 2007 Western Snowy Plover Recovery Plan indicates that this species has not been found breeding at Carlsbad State Beach. The area, however, provides potential foraging habitat for the species. Because foraging opportunities are limited by existing human activities at Carlsbad State Beach and Project activities on the beach would be short-term (5 months), it is unlikely that the Project would have a substantial adverse effect on the western snowy plover, and this impact would be less than significant.

Marine Biology

<u>Grunion Spawning</u>

**Less than Significant Impact.** The Project has the potential to impact grunion spawning habitat. Grunion spawning occurs from March through August and occasionally in February and September, with peak spawning in late March to early June (CDFW 2014). Due the abundance of grunion spawning habitat elsewhere in the region and the scheduling of beach segment decommissioning activities during most of the non-grunion spawning periods, the impact to grunion habitat is considered less than significant. Although impacts to grunion are considered less than significant, decommissioning of the beach and surf zone segments is scheduled to begin in September and may overlap with the end of the grunion spawning season. To further

reduce the potential for impacts and ensure they remain less than significant, the following APMs would be implemented.

> **APM BIO-1a: Grunion Avoidance.** Intertidal activities will be scheduled outside of the grunion spawning season, which is generally three or four nights after the highest tide associated with each full or new moon and then only for a 1- to 3-hour period each night following high tide from late February or early March to August or early September.

> **APM BIO-1b: Grunion Surveys and Avoidance.** If scheduling is not possible under APM BIO-1a, intertidal grunion surveys will be conducted during grunion spawning tidal periods to document that grunion have not used the site. Intertidal activities shall not occur if grunion spawning is observed in the Project area.

Marine Vessel and Marine Wildlife Interaction

**Less than Significant with Mitigation.** Project-related vessel activity in the Project area and to and from the Project's shore base would increase the probability of marine vessel and marine wildlife interactions, including collisions. The shore base for offshore marine operations is unknown at this time; however, the most likely local embarkation point would be Oceanside Harbor due to its proximity to the Project area. If dockage cannot be found there, however, the shore base may be located in the Port of Long Beach, Port of Los Angeles, or Unified Port of San Diego. Marine mammals are expected to be present within the Project area's marine waters throughout the year. Currently, Project activities are scheduled to avoid the gray whale migration period (December through May) with the exception of the certain phases/tasks associated with decommissioning the offshore segment, which would extend into the beginning of January. Potential impacts to marine wildlife from interactions with Project vessels (e.g., harassment or strikes) during transit are considered possible, though unlikely.

To ensure that potential vessel-related impacts to marine wildlife as a result of Project activities are avoided or minimized to less than significant, the following measure would be implemented.

> **MM BIO-1: Marine Wildlife Contingency Plan (MWCP).** A MWCP shall be prepared for review and approval by California State Lands Commission staff prior to the commencement of decommissioning activities. The MWCP shall include, but not be limited to, the following elements:
>
> - Description of the pre-decommissioning training seminar that will be provided to educate Project personnel on identifying marine wildlife in the Project area and to provide an overview of the wildlife mitigation measures to be implemented;
> - Qualifications, number, location, and authority of onboard Marine Wildlife Monitors (MWMs);

- Acoustic safety zone radius that will be enforced by the MWMs during dynamic pipe ramming activities;
- Distance, speed, and direction transiting vessels will maintain when in proximity to a marine mammal or reptile;
- Discussion of how impacts associated with marine wildlife entanglement in Project vessel anchor lines will be minimized; and
- Observation recording procedures and reporting requirements in the event of an observed impact to marine wildlife.

Marine Wildlife Anchor Line Entanglement

**Less than Significant with Mitigation.** Once onsite, Project vessels would be anchored during MOT decommissioning, creating the potential for marine wildlife entanglement in Project-associated anchor lines. However, with the implementation of **MM BIO-1**, the potential for marine wildlife entanglement in anchor lines would be reduced to less than significant.

Underwater Noise Impacts from Dynamic Pipe Ramming

If conventional removal methods are not successful in removing the surf zone segment of the fuel oil submarine pipeline, dynamic pipe ramming (DPR) may be employed, which may result in significant underwater noise impacts to marine wildlife. (DPR uses a hammer that is pneumatically or hydraulically powered to drive [push] or extract [pull] an attached section of the pipeline.) As a result, Greeneridge Sciences, Inc. (Greeneridge) was contracted to perform an evaluation of DPR's potential acoustic impacts on marine wildlife (Grebner and Kim 2015; Appendix J), which serves as the basis for the acoustic impact analysis described below.[9]

Greeneridge reported that the acoustic propagation conditions at the MOT site suggest that sound levels will decrease relatively rapidly with increasing range from the DPR source. Further, DPR operations are expected to be short-term and only last approximately four hours. Additional noise insulation would occur from the concrete coating around the pipeline and because much of the fuel oil submarine pipeline within the surf zone segment is buried. Although no published data are available on the sound levels and frequency composition of DPR, the physical characteristics of DPR are similar to vibratory pile driving, which were used by Greeneridge to provide a qualitative evaluation of potential acoustic impacts on marine wildlife. A quantitative evaluation was not provided because, even assuming vibratory pile driving is a reasonable proxy for

[9] Greeneridge's acoustic impact analysis is based on the National Marine Fisheries Service's (NMFS) current acoustic thresholds. The acoustic safety zone to be implemented during DPR activities will reflect NMFS's updated and finalized acoustic thresholds (anticipated in late 2015). Refer to the following section, *Marine Mammals*, for more information.

DPR, the limited and highly variable acoustic measurements available for vibratory pile driving prohibit meaningful quantitative estimates of sound produced for comparison to regulatory standards for acoustic impacts to marine wildlife.

As described in Greeneridge's report, the vibratory pile driving proxy showed sound energy over a broad range of frequencies. The highest sound pressure level (SPL) was about 180 decibels (dB) referenced to (re) 1 micropascal (µPa)[10] (root-mean-square [rms][11]), for the one-third octave band centered at 1 kilohertz (kHz). The frequency range from 400 Hertz (Hz) to 3 kHz is a region of high-energy for vibratory pile driving, with received levels of 170 dB re 1 µPa (rms) or more. Within a wider frequency range from 200 Hz to 10 kHz, received levels exceeded 160 dB re 1 µPa (rms).

The hearing ranges of all marine species examined in the Greeneridge report shared some degree of overlap with the sound frequencies produced by the pile driver proxy. Some species (baleen whales, pinnipeds, and birds) showed extensive overlap in hearing sensitivity with the proxy, while others (dolphins, fishes, and sea turtles) showed more limited overlap. Potential impacts to marine species are dependent on sound source levels and frequencies, animal hearing sensitivity, proximity to the sound source, noise duration, and time of operation.

Hearing sensitivities of marine species vary depending upon their anatomy and physiology. For example, some species, such as marine mammals, seem to be more sensitive to the sound pressure component of sound, while some fish appear to be more sensitive to the particle motion component of sound. Additionally, a species' hearing sensitivity to sound also varies depending upon the frequency of the sound, since not all marine species hear equally well at all frequencies. Potential acoustic-related impacts associated with DPR on marine species found within the Project area are discussed below.

*Marine Mammals*

**Less than Significant with Mitigation.** The National Marine Fisheries Service (NMFS), a division of the National Oceanic and Atmospheric Administration (NOAA), has identified acoustic threshold (received sound level) criteria above which marine mammals are predicted to experience changes in their hearing sensitivity, either permanent or temporary hearing threshold shifts. Physiological responses such as auditory or non-auditory tissue injuries are known as Level A Harassment in the MMPA and harm in the FESA. Level A Harassment becomes a concern when the sound levels from human-made sounds reach or exceed the acoustic threshold associated with

[10] 1 µPa is the reference sound pressure for sound in water.
[11] Root-mean-square (rms) is the average of the squared sound pressure over some duration.

auditory injury in marine species. A permanent threshold shift (PTS) is a permanent, irreversible increase in an animal's auditory threshold within a given frequency band or range of the animal's normal hearing. A temporary threshold shift (TTS) is a temporary, reversible increase in the threshold of audibility at a specific range of frequencies. While TTS is not an injury, it is considered Level B Harassment by the MMPA and harassment by the FESA. Along with TTS, Level B Harassment also includes behavioral impacts. For pinnipeds and cetaceans, NMFS has specified Level A SPL thresholds as 190 and 180 dB re 1 µPa (rms), respectively. The Level B SPL threshold for all marine mammals is 160 dB re 1 µPa (rms).

The current acoustic threshold levels, used for most sound sources, consist of a single threshold for cetaceans and a single threshold for pinnipeds regardless of the sound source. That is, they do not take into account exposure, duration, sound frequency composition, repetition rate, and a species' hearing sensitivity. In 2013, NMFS proposed new acoustic threshold levels in its Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing that take into account some of these factors, including dividing marine mammals into functional hearing groups. On July 23, 2015, NMFS released a second draft of its guidance document for a 45-day public comment period. NMFS anticipates that the guidance document will be finalized in late 2015, which will be used to inform the acoustic safety zone radius to be implemented during DPR activities.

Hearing group designations for marine mammal species are shown in Table 3.4-3. The assumption is that all species within a functional hearing group have approximately the same hearing sensitivity.

**Table 3.4-3. Functional Marine Mammal Hearing Groups and Ranges**

| Functional Hearing Group | Functional Hearing Range* |
|---|---|
| Low-frequency cetaceans[2] (baleen whales) | 7 Hz to 25 kHz |
| Mid-frequency cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales) | 150 Hz to 160 kHz |
| High-frequency cetaceans (true porpoises, *Kogia*, river dolphins, *Cephalorhynchus*, *Lagenorhynchus cruciger*, and *L. australis*) | 200 Hz to 180 kHz |
| Phocid pinnipeds (underwater) (true seals) | 75 Hz to 100 kHz |
| Otariid pinnipeds (underwater) (sea lions and fur seals) | 100 Hz to 48 kHz |

Acronyms: Hz = Hertz; kHz = kilohertz.

* Represents the frequency band of hearing for an entire group as a composite (i.e., all species within the group), where individual species' hearing ranges are typically not as broad. Functional hearing is defined as the range of frequencies a group hears without incorporating non-acoustic mechanisms (Wartzok and Ketten 1999). This is ~60 to ~70 dB above best hearing sensitivity (Southall et al. 2007) for all functional hearing groups except LF cetaceans, where no direct measurements on hearing are available. For LF cetaceans, the lower range is based on recommendations from Southall et al. 2007 and the upper range is based on information on inner ear anatomy and vocalizations.

Source: NOAA 2015.

Greeneridge found that low-frequency cetacean hearing overlaps with the entire higher energy region of the pile driver proxy. As noted in the Greeneridge report, gray whales are a low-frequency cetacean species likely to occur in the MOT area during decommissioning activities, and as such, could be impacted by DPR. During their southern migration, gray whales are abundant and often visible in nearshore waters from Monterey Bay to San Diego; offshore San Diego, gray whales usually swim within 6.2 miles (10 kilometers) of the coast. If DPR were to occur during their southern migration, gray whales have the potential to be exposed to the maximum energy levels emitted. If the vibratory pile driving characteristics of the proxy (e.g., frequency range and sound levels) is a close approximation to the actual unknown DPR emissions at the MOT location and gray whales are within 6.2 miles of shore, then behavioral impacts are potentially a concern. Proximity to the sound source is important for this species; however, impacts due to sound duration should be temporary since these whales are predominantly migrating and should not be deterred by any short divergences from their path, especially with a human-made sound nearshore. Outside of the December to mid-February timeframe, gray whales should not be impacted because they typically swim further offshore or are absent from the area. Presently, the Project is scheduled to avoid the gray whale migration season with the exception that offshore operations extend into the early part of January. As a result, there is the potential for DPR to significantly impact gray whales. Given the information above and the temporary use of DPR (approximately 4 hours), the implementation of **MM BIO-1** and the following measures would ensure that potential impacts to gray whales and other low-frequency cetacean species are avoided or mitigated to less than significant.

**MM BIO-2: Dynamic Pipe Ramming (DPR) Soft-Start and Ramp-Up Procedure.** The contractor conducting DPR operations shall begin the procedure at a reduced level and repeat the sound producing activity, gradually increasing the intensity of the operation prior to initiating normal construction levels. The duration of the ramp-up during Project operations shall be determined by a qualified marine biologist and based upon the findings of a sound source characterization study for DPR. This procedure will be used any time DPR operations are initiated.

**MM BIO-3: Dynamic Pipe Ramming (DPR) Sound Source Characterization.** Prior to DPR operations, a marine acoustics specialist shall be retained to conduct underwater noise measurements during a trial operation of the equipment at the Project site. In coordination with the National Oceanic and Atmospheric Administration (NOAA), the results of the underwater noise measurements shall be used to determine preclusion radii for marine wildlife (mammals and reptiles) safety during DPR operations based on NOAA's acoustic thresholds in place at the time of Project operations for permanent and temporary threshold shifts. A copy of the sound source characterization shall be provided to California State Lands Commission staff and NOAA within 2 weeks of completion.

The sound source characterization for DPR would likely be conducted immediately prior to Project operations using DPR since the DPR equipment would be onsite.

> **MM BIO-4: Marine Wildlife Monitoring During Sound Source Characterization and Dynamic Pipe Ramming (DPR).** Qualified marine wildlife monitors (MWMs) shall be onsite and present throughout sound source characterization and DPR operations. Once the marine wildlife preclusion radii (i.e., safety zone) have been determined, MWMs shall be located such that he/she has a clear view of the marine waters within the safety zone and beyond. The MWMs shall indicate that a designated safety zone is clear of marine wildlife (mammals and reptiles) prior to the start of DPR operations and shall have the authority to stop DPR operations if marine wildlife are observed at any time within the safety zone. The initial safety zone to be implemented during sound source characterization will be 1,000 feet. The initial safety zone will be revised to reflect new thresholds for permanent and temporary threshold shifts (PTS and TTS) should they be finalized by the National Oceanic and Atmospheric Administration prior to Project operations. The safety zone to be implemented during DPR will be modified as necessary based on the sound source characterization results and will reflect the PTS and TTS thresholds in place at the time of Project operations.

As indicated above, a 1,000-foot safety zone would be implemented during sound source characterization. This safety zone is based upon a conservative model of acoustic propagation for the DPR proxy provided by Greeneridge, which indicates that the safety radii for a received level of 180 dB re 1 µPa is 260 m or 853 feet.

Greeneridge found that mid-frequency cetacean hearing only partially overlaps the frequency range of the pile driver proxy, so impacts to mid-frequency cetaceans are expected to be minimal, except for the coastal bottlenose dolphin. Both the common and Pacific-white sided dolphins are expected to be found along or seaward of the 100-fathom curve (i.e., region where water depth is 600 feet or more), which is several kilometers from the sound source at the MOT location. While these dolphins may detect the DPR, the impact is expected to be low. These two species also forage at night when presumably construction operation would cease. The coastal bottlenose dolphin spends most of its time within 1,640 feet of shore and shoreward of the MOT location. The pile driver proxy sound levels are highest at approximately 1 kHz, which is a region of low hearing sensitivity in bottlenose dolphins. Meanwhile, the region of the dolphins' greatest sensitivity (approximately 10 kHz) corresponds to frequencies at which the energy content of the pile driving is low. If these coastal dolphins are in the area, their foraging, communication, and normal swimming trajectories could be impacted, as well as vocal communication masked. Given the information above and the temporary use of DPR (approximately 4 hours), along with the implementation of **MM BIO-1**, **MM BIO-2**, **MM BIO-3**, and **MM BIO-4**, potential impacts to mid-frequency cetaceans likely to be found near the MOT would be avoided or mitigated to less than significant.

Greeneridge did not identify any high-frequency cetaceans in or near the Project area that would temporally or spatially overlap with DPR activities; however, the implementation of **MM BIO-1**, **MM BIO-2**, **MM BIO-3**, and **MM BIO-4** would ensure that potential impacts to any high-frequency cetaceans near the MOT are avoided or mitigated to less than significant. Greeneridge also found that the hearing ranges for both the harbor seal and California sea lion overlap the entire frequency range of the pile driver proxy. Furthermore, the highest sound levels for the pile driver proxy overlap frequencies at which pinniped hearing is most sensitive. Harbor seals and California sea lions that may be seen near the MOT location are likely local inhabitants that swim close to shore. Both the sound level and duration of exposure to DPR would increase the impact on these pinnipeds. While pinnipeds are capable of swimming away from the Project site, some animals may remain if the immediate area is their habitat or they may be disoriented by the sound. As a result, DPR could result in a potentially significant impact to harbor seals and California sea lions. Given the information above and the temporary use of DPR (approximately 4 hours), along with the implementation of **MM BIO-1**, **MM BIO-2**, **MM BIO-3**, and **MM BIO-4**, potential impacts to pinnipeds found near the MOT would be avoided or mitigated to less than significant.

*Sea Turtles*

**Less than Significant with Mitigation.** Sea turtles appear to be sensitive to low-frequency sounds with a functional hearing range of approximately 100 Hz to 1.1 kHz. It has been suggested that sea turtle hearing thresholds should be equivalent to TTS thresholds for low-frequency cetaceans when animals are exposed to impulsive (e.g., impact pile driving) and non-impulsive (e.g., vibratory pile driving, DPR) anthropogenic sounds. However, more recently, the Acoustical Society of America standards committee suggested that sea turtle hearing was probably more similar to that of fishes than marine mammals. Turtles have been presumed to have the same thresholds as those fishes with swim bladders not involved in hearing. Thus, sea turtle mortality and mortal injury would be expected at sound levels greater than a $SEL_{cum}$ of 210 dB re 1 $\mu Pa^2$-s and a SPL of 207 dB re 1 µPa (peak) (see Appendix J for more information).

With respect to sea turtles, Greeneridge found that there is overlap between the hearing range of sea turtles and the sound frequencies produced by the pile driver proxy, but the proxy's frequency of maximum energy (1 kHz) is at the upper end of their hearing range, where their ability to detect the sound is expected to be poor. The sound level and duration of exposure are likely important components for sea turtles since they are slow swimmers and it would take longer for them to leave an area. Leatherback sea turtles may be the most impacted by noise exposure due to their broader hearing range (i.e., 200 Hz to 1 kHz); however, the likelihood of this species being in the MOT area is very low. Some potential responses of sea turtles to human-made sounds include increased surface time, decreased foraging, displacement, and startle reactions. Leatherback sea turtles are an endangered species wherever they are found, and both

green and olive ridley sea turtles are threatened species, so extra precautions and potential mitigation are warranted if they enter the area. As a result, DPR could result in a potentially significant impact to sea turtles found near the MOT. Given the information above and the temporary use of DPR (approximately 4 hours), along with the implementation of **MM BIO-1**, **MM BIO-2**, **MM BIO-3**, and **MM BIO-4**, impacts to sea turtles would be avoided or mitigated to less than significant.

*Fish*

**Less than Significant.** Hearing capabilities vary considerably between fish species and within fish groups. Fish species within a group may also differ substantially in terms of their hearing structures. Fishes hear when hair cells are directly stimulated by particle motion in the water. Some fishes also have swim bladders or other air sacs that can detect and convert the pressure component of a sound field into particle motion, which directly stimulates the inner ear, allowing the fishes to detect sound. The majority of fishes are hearing generalists, which usually only hear sounds up to 1.5 kHz. Hearing specialists, some of which can hear sounds up to 3 to 4 kHz or more, have adaptations that lower their hearing threshold, thereby enhancing their ability to detect sounds in their hearing range (Popper 2003; Hastings and Popper 2005). For instance, unlike hearing generalists, whose primary hearing is provided by direct stimulation of the inner ear, hearing specialists have evolved several mechanisms to acoustically couple the swim bladder to the middle ear. Specializations that enhance hearing vary among species and may include an extension of the swim bladder, a direct mechanical connection between the swim bladder and inner ear, or a separate bubble of gas near the ear (Ramcharitar et al. 2001; Hastings and Popper 2005; Popper et al. 2014). Mortality and injury to fish as a result of sound varies depending upon the anatomy and physiology of the fish. For example, mortality and potential mortal injury thresholds for fishes with swim bladders are lower than for fishes without swim bladders.

The only U.S. regulatory guidelines for the effects of sound on fish were developed by the Fisheries Hydroacoustic Working Group, which stated a SPL of 206 dB re 1 µPa (peak) for the onset of physiological effects of pile driving on fish. In 2014, the Acoustical Society of America developed guidelines for sound exposure criteria for fish and grouped them into four categories: (1) fish with no swim bladder; (2) fish with a swim bladder not involved in hearing; (3) fish with a swim bladder involved in hearing; and (4) eggs and larvae. These guidelines suggest that mortality and mortal injury would be expected for fish with swim bladders and eggs and larvae at sound levels greater than a cumulative sound exposure level ($SEL_{cum}$)[12] of 210 dB re 1 $\mu Pa^2$-s and a SPL of 207 dB re 1 µPa (peak). For fish with no swim bladders, mortality and mortal

[12] The cumulative sound exposure level ($SEL_{cum}$) is the total cumulative energy received by an organism or object over time in a sound field.

injury would be expected at sound levels greater than a $SEL_{cum}$ of 219 dB re 1 $\mu Pa^2$-s and a SPL of 213 dB re 1 µPa (peak). A discussion of these guidelines is provided in the report prepared by Greeneridge and is provided as Appendix J.

It is thought that the fishes in the Pacific Ocean are mostly hearing generalists (Hastings and Popper 2005). Hearing thresholds for fish that may be in the Project area (e.g., blackeye goby, sand bass, kelp bass, white croaker, northern anchovy) partially overlap with the frequency region of high energy for the pile driver proxy (Appendix J, Table 4, provides impact pile driving exposure criteria for fishes). Considering hearing sensitivity alone, the northern anchovy, a hearing specialist, would be able to detect the highest energy levels of the pile driver proxy and may be the most sensitive to sound levels emitted by DPR. However, fish injuries are more related to particle motion than pressure and increased sound levels may affect sensory cilia located along their bodies and in their inner ears. In general, fishes are especially sensitive to sound and those within close proximity to a loud or prolonged sound source may be impacted by death, hearing loss, and non-auditory tissue damage. Non-fatal responses of fish to sound include changes in swimming behavior, water column position, and schooling patterns, and may also elicit startle responses, area evacuation, and freezing in place reactions. Since fishes have such diverse ecologies, both the sound level exposure and duration would be important to the overall fish environment in the MOT area. In the case of DPR operations at the Project site, it is possible that fishes, depending upon their proximity to the noise source, may be fatally injured or exhibit non-fatal responses such as moving further away from the sound source. Because DPR activities would be temporary (approximately 4 hours) and there are no protected fish species in the Project area, this impact is considered less than significant.

*Birds*

**Less than Significant.** According to the Greeneridge report, compared to other vertebrates, birds have relatively consistent auditory structures and hearing capabilities regardless of size. The center-frequency and high-frequency limits of bird hearing, however, are inversely proportional to the bird's size and weight. On average, a bird's hearing ranges from 500 Hz to 6 kHz, with some exceptions, and no birds are known to hear over 15 kHz. There is only extremely limited information on diving bird sensitivity to sound underwater; therefore, the discussion of bird hearing and impacts presented in the Greeneridge report is derived from in-air audiograms. Additionally, there are no underwater acoustic guidelines for diving birds.

The frequency regions of high-energy levels for the pile driver proxy coincide with the greatest in-air hearing sensitivity for diving birds (1 to 3 kHz) and for birds, in general (approximately 1 to 4 kHz). Diving birds are especially vulnerable approaching a sound source not only because birds have higher thresholds of hearing (i.e., less sensitive hearing) than humans, but also because the sound-reflecting nature of the air-sea

interface tends to trap waterborne sounds beneath the sea surface. Birds are likely to detect lower-level DPR sounds only shortly before encountering the support vessel, and there likely would be few or no indicators of underwater DPR noise until a bird lands upon or dives into the water. Birds on the water or diving in the area have the potential to be exposed to the maximum sound energy from DPR. Near a pile driving site off Point Loma, CA, least tern counts were lower on days with pile driving compared to days without pile driving. Potential indicators of behavioral stresses due to noise on birds may include a startle response, difficulty detecting prey or predators, masking of communication sounds, physical displacement, and changing breeding or nesting sight locations. Awareness of bird species and their responses are especially important since some of the birds in the area are listed as threatened or endangered species. As stated in the Greeneridge report, since the duration of underwater sound exposure for diving birds is expected to be short, TTS and PTS resulting from DPR are unlikely. Impacts to birds above water would likely be limited to startle responses and avoidance of the area during DPR. Further, DPR operations are scheduled to occur outside of the bird breeding and nesting season (February through July), so breeding and nesting activities would not be impacted. Given the information above and the temporary use of DPR (approximately 4 hours), this impact is considered to be less than significant.

Underwater Noise Impacts from Pre- and Post-Decommissioning Surveys

**Less than Significant with Mitigation.** Pre- and post-decommissioning seafloor debris surveys would be conducted utilizing geophysical survey equipment (a side-scan sonar or equivalent) within the Project area. The purpose of the pre-decommissioning survey is to provide a baseline image of the seafloor that can be used to check against the results of a post-decommissioning survey to ensure that any decommissioning-related debris is identified and recovered. The post-decommissioning survey would aid in identifying targeted debris items that were missed or may have resulted from offshore decommissioning operations.

These surveys would require the use of a marine vessel and geophysical equipment that generate noise during the data acquisition. **MM BIO-5** requires the Applicant to obtain a geophysical survey permit through the CSLC's Low-Energy Offshore Geophysical Permit Program (OGPP). The OGPP requirements include the protection of marine wildlife from potential noise impacts associated with such surveys. A separate MWCP would be prepared for these surveys to meet the OGPP requirements and include, at a minimum, information on the following:

- Survey location, schedule, and proposed survey track lines;
- Survey vessel(s);
- Survey equipment (e.g., frequency, source level);
- Safety zones;

- Qualifications, number, location, and authority of onboard MWMs;
- Information on marine wildlife that may occur in the proposed survey area;
- Distance, speed, and direction transiting vessels would maintain when in proximity to a marine mammal or reptile;
- Observation recording procedures and reporting requirements in the event of an observed impact to marine wildlife; and
- Other site-specific considerations relevant to the survey design.

With the inclusion of **MM BIO-5**, noise impacts associated with the pre- and post-decommissioning seafloor debris surveys would be reduced to less than significant.

> **MM BIO-5: Pre- and Post-Decommissioning Seafloor Debris Survey and Debris Removal.** The offshore work shall begin and end with seafloor debris surveys. The Applicant's contractor shall perform a side-scan sonar (with 400% coverage) and bathymetric survey, or multi-beam sonar survey, of the underwater worksite prior to the arrival of the contractor's marine equipment spread at the worksite. The survey shall encompass the entire underwater worksite bordered by the contractor's planned derrick barge anchorages plus an offset of approximately 500 feet. Derrick barge anchorages shall be positioned to avoid rock outcroppings and kelp beds. A map shall be produced by the surveyor and shall serve as the baseline for the seafloor conditions at the underwater worksite prior to the start of work.
>
> All surveys employing low-energy geophysical equipment, including remotely operated vehicle surveys, must be conducted by an entity holding a valid geophysical survey permit under the California State Lands Commission's (CSLC) Low-Energy Offshore Geophysical Permit Program (see www.slc.ca.gov/Programs/OGPP.html). Therefore, the Applicant shall obtain a valid Permit prior to initiating the surveys.
>
> After decommissioning work is complete, the contractor shall be required to perform a second side-scan sonar (with 400% coverage) and bathymetric survey in the same underwater work area. The surveyors shall again produce a map of the survey area and use it to identify any items of seafloor debris introduced into the underwater worksite by decommissioning operations. The contractor shall remove all debris, if any, related to the offshore tanker berth facilities and operations and the decommissioning work.
>
> The Applicant shall provide: (1) the pre-decommissioning survey map to CSLC staff and permitting agencies for approval at least 60 days prior to Project implementation; and (2) the post-decommissioning map to CSLC staff within 30 days of survey completion for agency sign-off.

***b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

Terrestrial Environment

**Less than Significant.** The EPS is located within the boundary of the City of Carlsbad's HMP, which guides the local implementation of the North County MHCP. The North County MHCP focuses on habitat preservation and enhancement for the California gnatcatcher, and Agua Hedionda Lagoon (located approximately 300 feet north of the fuel oil submarine pipeline) and adjacent areas to the east have been designated as core habitat areas for this species. The Agua Hedionda Lagoon also supports special-status species; however, the EPS and onshore fuel oil submarine pipeline do not provide suitable habitat for these species, except for the coast-woolly head and western snowy plover described in item ***a)***, where the Project was found to have a less than significant impact on these two species. Given the information above and in item ***a)***, the Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community, and this impact would be less than significant.

**Marine Environment**

The marine environment is considered to be a sensitive resource and is protected, as described in Section 3.4.2, through the implementation of the California Coastal Act, MLPA, MSA, and other regulations specific to particular species, including marine species. Hard bottom habitat in the Project area is considered a sensitive marine community because it is one of the least abundant benthic habitats along the southern California coast, yet is among the most important habitats for rockfish and other marine species. Additionally, hard bottom substrate provides a base for kelp stands, which in turn provide nurseries, feeding grounds, and shelter to a variety of marine species.

<u>Potential Seafloor/Hard Bottom Disturbance and Debris</u>

**Less than Significant with Mitigation.** During the removal of Project infrastructure (e.g., anchors, chains, fuel oil submarine pipeline) from the sea floor, ocean sediments would be disturbed, mixing with the water column and creating turbidity. As these sediments precipitate, they may be redistributed onto rocky substrate in the Project area and cover bottom-dwelling organisms. Increased turbidity may also temporarily interfere with light penetration and photosynthesis in nearby kelp beds, while changes in water clarity may temporarily reduce the suitability of the water for habitation by fish. However, these impacts are expected to be short-term, limited in areal extent, and similar to turbidity generated by storm waves. Other sedimentary habitat alteration could occur if pieces of concrete coating fall off of the fuel oil submarine pipeline. To ensure that

pieces of concrete and other debris are not left on the seafloor, **MM BIO-5** would be implemented to mitigate the potential impact to less than significant.

The Project may also result in the loss of hard bottom associated with the temporary removal of the riprap groin on the beach. This temporary removal of riprap for the excavation of the fuel oil submarine pipeline is considered less than significant as this habitat is routinely scoured and supports an epibiota that is common throughout the region on similar substrates. Hard bottom habitat may also be lost due to the removal of the pipeline (exposed/non-buried segments) and the associated mooring anchors and chains; however, this would be a less than significant impact due to their limited size and habitat value.

Placement of anchors and/or anchor lines from Project-related vessels may also result in potential damage to sensitive rocky habitat and kelp beds. To ensure that impacts to sensitive rocky habitat and kelp beds from anchors and/or anchor lines are avoided or mitigated to less than significant, the following measure would be implemented.

> **MM BIO-6: Final Marine Safety and Anchoring Plan (MSAP).** A final MSAP shall be developed following the analysis of seafloor habitat and bathymetric data to be collected during the pre-decommissioning survey. Additionally, a diver-biologist survey shall be conducted to ensure that all pre-determined vessel anchor locations are positioned in sedimentary habitats and avoid rocky substrate and kelp by at least 50 feet. The final plan shall be submitted to California State Lands Commission staff for review at least 2 weeks prior to the commencement of Project activities.

A draft MSAP for the Project can be found in Appendix E that includes measures to avoid such impacts.

Potential Discharge of Petroleum Products and Biocide

**Less than Significant with Mitigation.** The Project may result in an accidental discharge of petroleum products from Project vessels and equipment, which would have the potential to significantly impact marine resources. The Applicant would implement the following mitigation measure to avoid or reduce potential impacts associated with an accidental discharge of petroleum products from Project vessels and equipment to less than significant.

> **MM BIO-7: Oil Spill Response Plan (OSRP).** An OSRP has been prepared for the Project. Each Project vessel shall have a copy of the plan and shall maintain the required onboard and subcontracted spill response equipment. Additional shore-based response equipment shall be onsite, which can be used for first-response containment and collection of petroleum that reaches the shoreline. If needed, subcontracted shoreline recovery personnel and additional equipment,

as identified in the OSRP shall be deployed to the site to assist in the recovery and disposal of spilled petroleum.

The OSRP for the Project can be found in Appendix G.

Although the fuel oil submarine pipeline was flushed and pigged, residual petroleum products and the biocide associated with the Nalco EC6106A preservative may be present. To ensure that potential impacts to marine habitats and biota associated with an accidental release into the marine environment of petroleum products and the Nalco EC6106A biocide preservative are avoided or reduced to less than significant, the following measure would be implemented.

> **MM BIO-8: Flush Fuel Oil Submarine Pipeline.** Prior to opening the fuel oil submarine pipeline to the ocean during the decommissioning process, this pipeline shall be flushed from its offshore termination to its onshore termination at the beach valve pit with seawater to displace the potable water and preservative. The potable water and preservative mixture shall be recovered at the beach valve pit and transported off-site for treatment and disposal.

Potential Spread of NAS

**Less than Significant Impact.** Due to the use of marine vessels, the Project may result in the spread of NAS through ballast water and vessel biofouling. However, the potential spread of NAS would be addressed through the implementation of existing CSLC programs, including the CSLC's Ballast Water Management Program and Biofouling Removal and Hull Husbandry Reporting. Additionally, the Project's potential contribution to the spread of NAS would be further minimized by implementation of the following APM.

> **APM BIO-2: Prevent Introduction of Non-Native Aquatic Species (NAS).** All Project vessels shall: (1) originate from Oceanside Harbor, the Ports of Long Beach/Los Angeles, or San Diego Bay; (2) be continuously based out of Oceanside Harbor, the Ports of Long Beach/Los Angeles, or San Diego Bay since last dry docking; or (3) have underwater surfaces cleaned before entering southern California at vessel origination point and immediately prior to transiting to the Project site. Additionally, and regardless of vessel size, ballast water for all Project vessels must be managed consistent with California State Lands Commission (CSLC) ballast management regulations, and Biofouling Removal and Hull Husbandry Reporting Forms shall be submitted to CSLC staff. Project vessels shall also be available for inspection by CSLC staff for compliance. Further, as part of the Project kickoff meeting, a qualified marine biologist, approved by CSLC staff, shall provide information to all Project personnel about the spread of NAS in California waters and the programs (CSLC Ballast Water

Management Program and Biofouling Removal and Hull Husbandry Reporting) that will be implemented to minimize this hazard.

***c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

**No Impact.** The Project is not located within or adjacent to federally protected wetlands as defined in Section 404 of the Clean Water Act; therefore, the Project would have no impact to federally protected wetlands.

***d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

**Less than Significant Impact.** The Project may affect the movement of terrestrial and marine wildlife as a result of decommissioning activities, which would occupy certain areas of the land and ocean. However, the Project would not substantially interfere with the movement of migratory fish or wildlife species or impeded the use of native wildlife nursery sites, as described in ***a)***, due to the temporary, short-term nature of the Project and the limited area of disturbance associated with decommissioning activities; therefore, the impact would be less than significant.

***e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?***

**Less than Significant with Mitigation.** The City of Carlsbad OSCE goals, objective, and policy, as described in Section 3.4.2 Regulatory Setting, seek(s) to preserve natural resources by protecting fish, wildlife, and vegetation habitats. As described above under item a), the Project has the potential to adversely impact grunion and significantly impact other sensitive marine wildlife. To avoid or reduce potential impacts to fish as wildlife to less than significant, **MM BIO-1** through **MM BIO-7** would be implemented, which would also meet the intent of the relevant OSCE goals, objective, and policy.

***f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?***

**No Impact.** As described above, the EPS is located within the boundary of the City of Carlsbad's HMP, which guides local implementation of the MHCP. The MHCP focuses on habitat preservation and enhancement for the California gnatcatcher, Agua Hedionda Lagoon, and adjacent areas to the east as core habitat area; however, Project activities would not impact the Agua Hedionda Lagoon or adjacent areas that

the MHCP designates as core habitat. Since the Project does not conflict with local, regional, or State habitat conservation plan provisions, there would be no impact.

### 3.4.4 Mitigation Summary

Implementation of the following mitigation measure(s) would reduce the potential for Project-related impacts to biological resources to less than significant.

- MM BIO-1: Marine Wildlife Contingency Plan (MWCP).
- MM BIO-2: Dynamic Pipe Ramming (DPR) Soft-Start and Ramp-Up Procedure.
- MM BIO-3: Dynamic Pipe Ramming (DPR) Sound Source Characterization.
- MM BIO-4: Marine Wildlife Monitoring During Sound Source Characterization and Dynamic Pipe Ramming (DPR).
- MM BIO-5: Pre- and Post-Decommissioning Seafloor Debris Survey and Debris Removal.
- MM BIO-6: Final Marine Safety and Anchoring Plan (MSAP).
- MM BIO-7: Oil Spill Response Plan (OSRP).
- MM BIO-8: Flush Fuel Oil Submarine Pipeline.

The following measures are proposed by the Applicant to further reduce less than significant impacts to grunion spawning and transfer of NAS.

- APM BIO-1a: Grunion Avoidance.
- APM BIO-1b: Grunion Surveys and Avoidance.
- APM BIO-2: Prevent Introduction of Non-Native Aquatic Species (NAS).