Section 2.3

Biological Environment

2.3 BIOLOGICAL ENVIRONMENT

Information within this section is summarized from the 2008 Revised Natural Environment Study Report.

2.3.1 Natural Communities

2.3.1.1 Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors (including fish passage as appropriate) and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation includes the potential for dividing sensitive habitat and thereby lessening its biological value.

Critical habitat areas designed under the Federal Endangered Species Act (ESA) are discussed in Section 2.3.5 (Threatened and Endangered Species). Habitat areas related to Wetlands and Other Waters of the U.S. are Section 2.3.2.

2.3.1.2 Affected Environment

Literature Review

Terrestrial and marine biological resources within the project vicinity were first examined in existing documents, including:

- Final Environmental Impact Statement/ Environmental Impact Report for the Disposal and Reuse of Long Beach Naval Complex, Long Beach, California. Volume I (U.S. Navy/ City of Long Beach, 1998).
- Baseline Biological Studies of the Los Angeles and Long Beach Harbors conducted in 2000-2001 (MEC, 2002).
- Biological Baseline Study of Selected Areas of Long Beach Harbor: Final Report (SAIC and MEC, 1997).
- Peregrine Falcon Monitoring and Mitigation for the Desmond Bridge Widening Project. (BioResource Consultants, 1998).
- Foraging Surveys of the California Least Tern at the Shallow Water Habitat Area Long Beach Outer Harbor Port of Long Beach. (Keane Biological Consulting, 2001).
- California Least Tern Breeding Survey, 2005 Season (Marschalek, 2006).
- Documents providing information on special-status species that may occur in the Biological Study Area (BSA) and its vicinity; these are further discussed in Section 2.3.5 (Threatened and Endangered Species).

The study methodology also included consultation with state and federal resource agencies and the Port. Agency coordination took place through e-mail, fax, mail, and telephone correspondence, as summarized in Table 2.3.1-1. In addition, agencies were sent an NOP/Preliminary Environmental Assessment Report (PEAR) in November 2002 and the December 2005 revised NOP.

Table 2.3.1-1
Agency Coordination for Gerald Desmond Bridge Replacement Project
Biological Resources

Name (Agency)	Date	Subject
Annie (Hoecker) Little, Biologist, USFWS	July 25, 2002	Peregrine falcons, special-status bats, and birds in the BSA
Kerri Davis, Biologist (USFWS)	August 6, 2002	
Warren Wong, Biologist, CDFG	August 8, 2003	
Stephanie Remington, Bat Specialist	November and December 2005	
Stacey Crouch, Senior Environmental Specialist, POLB	July 31, 2002 August 2, 2002 August 23, 2002	Peregrine falcon nesting in the BSA
Carl G. Thelander, Biologist and Peregrine Falcon Specialist Expert Specialist, BioResource Consultants	July 31, 2002	
	March 30, 2006	
Jeffery Sipple, Peregrine Falcon Specialist	April 6, 2006 April 10, 2006	

The Biological Study Area (BSA)

The BSA for the proposed project is located entirely within the Inner Harbor portion of the Long Beach Harbor (Exhibit 2.3.1-1). It includes the area potentially affected by the proposed bridge replacement, as well as areas potentially affected by the proposed realignment of transmission lines (part of the North- and South-side Alignment Alternatives) from the Terminal Island generating station, across the Cerritos Channel up to the proposed Anaheim Substation north of Anaheim Street (see Exhibit 1-5). Specifically, the BSA includes existing terrestrial environment on both sides of the bridge extending approximately 0.25-mi (0.4-km) to the north and 0.25-mi (0.4-km) to the south. This area would include new bridge piers and footings, and adjacent areas for construction staging. In addition to terrestrial resources, the BSA includes marine resources beneath the bridge in the Back Channel and transmission lines over the Cerritos Channel, as well as nesting, roosting, and perching habitat for birds and bats provided by the existing bridge (Exhibit 2.3.1-2). Habitats of the outer Long Beach and Los Angeles Harbors (Exhibit 2.3.1-2) are not within the BSA because they would not be directly affected by the proposed project; however, threatened and endangered species known to occur in the outer harbor are discussed in this section because they may be indirectly affected by the proposed project.

Field surveys of the BSA's terrestrial resources were conducted on October 25, 2002, by Parsons staff environmental specialists and biologists Jay Officer and Rosemarie Crisologo. Surveys examined the vegetation of the BSA within the approaches to and beneath the bridge, including the shoreline of the Back Channel and the Cerritos Channel. Surveys also documented wildlife species observed in the BSA. In addition to general surveys, Parsons staff biologist John Martin conducted diurnal and nocturnal bat surveys, along with other biological resources surveys, to detect use of the bridge by bats. Bats were visually observed and audibly detected using a Skye Instruments Sonic Bat Detector beneath and adjacent to the bridge from 5:00 p.m. to 11:00 p.m. from July 31 through August 2, 2003.

No surveys of the BSA's marine resources were conducted because the literature review described above provided sufficient recent information on the marine resources of the BSA and vicinity.

The literature review also provided sufficient information on special-status species[8] in the BSA, and the field survey indicated that aside from some foraging opportunities, no habitat[9] to support special-status species was present in the BSA; therefore, aside from bat surveys described above, no focused surveys for special-status species were conducted.

Development of Long Beach Harbor through dredging, filling, and channelization over the past 100 years has altered the original physiography and habitats of the area. Once an estuary of the Los Angeles and San Gabriel Rivers, development of Long Beach Harbor has been transformed from a shallow estuarine habitat into mainly deepwater habitat. Dredge-and-fill operations to deepen channels to accommodate deep draft vessels and to develop terminals have eliminated former habitats.

Since the early 1900s, fills of land in the site area were constructed by hydraulic placement of material dredged from the harbor floor. The hydraulic fill deposits range from soft silt and clay to fine-grained, loose, silty sand and sand. These deposits were then overlain by 4 to 8 ft (1.2 to 2.5 m) of compacted hydraulic fill retained by rock dikes. These dikes may consist of several lifts of quarry waste containing sandy gravel with cobbles (typically less than 12 in. [304 mm] in diameter) and some silt. No sandy beach or salt marsh habitat and very little shallow-water habitat remain in the Port.

2.3.1.3 Environmental Consequences

Evaluation Criteria

The following criteria are the basis for evaluating whether there are substantial adverse effects to natural communities resulting from project development. Would the project:

- Have a substantial adverse effect on any sensitive natural community identified in any federal plans, policies, or regulation, or by the U.S. Fish and Wildlife Service (USFWS).

[8] Species that have been afforded special recognition by state and federal resource agencies and resource conservation organizations due to declining or limited population sizes.

[9] A place exhibiting environmental conditions under which a given species would normally and naturally live. Generally, these conditions include food availability (i.e., soil nutrients for plants), water, shelter (i.e., escape cover, protection from weather), and space requirements.

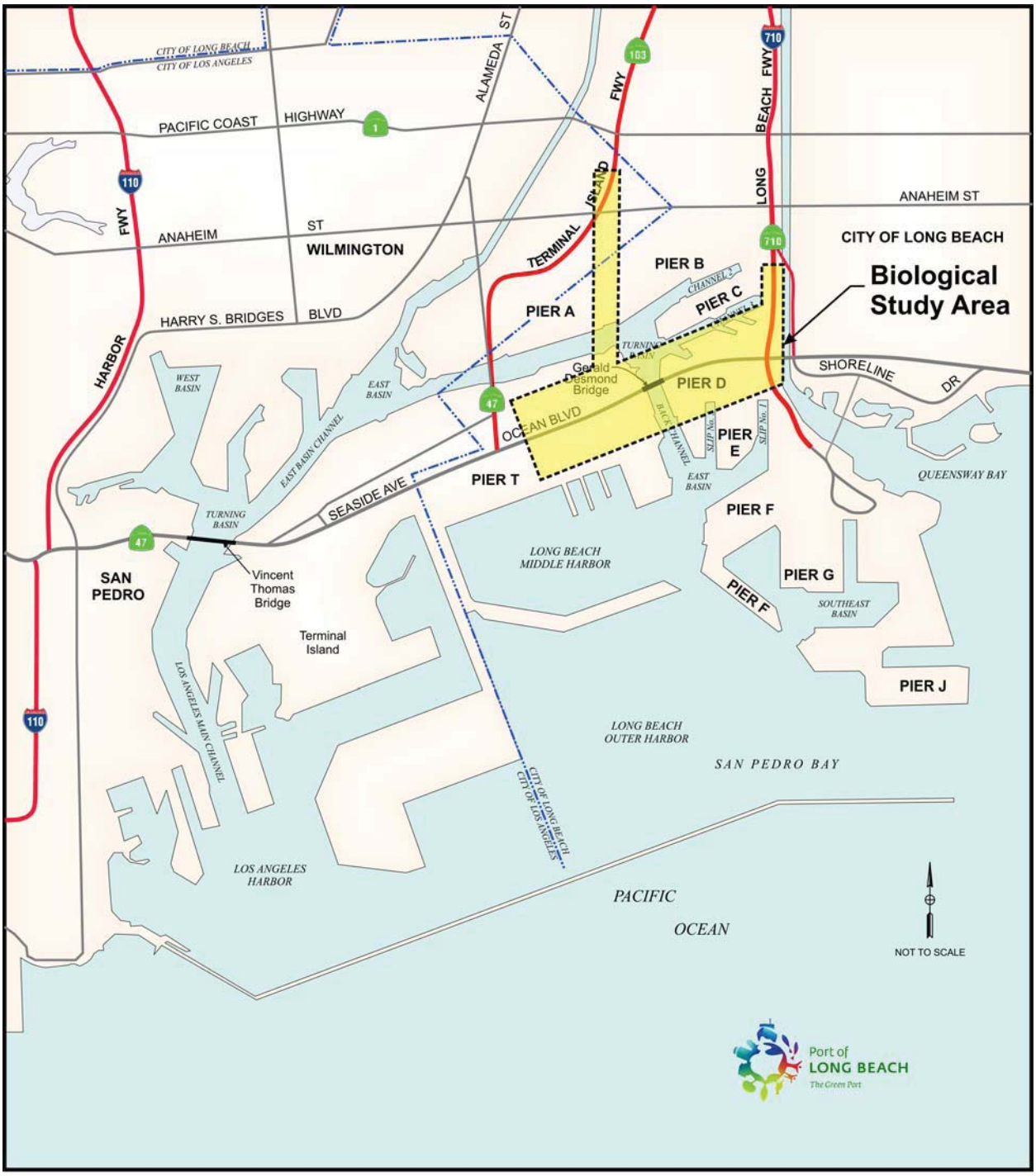

EXHIBIT 2.3.1-1
Biological Study Area

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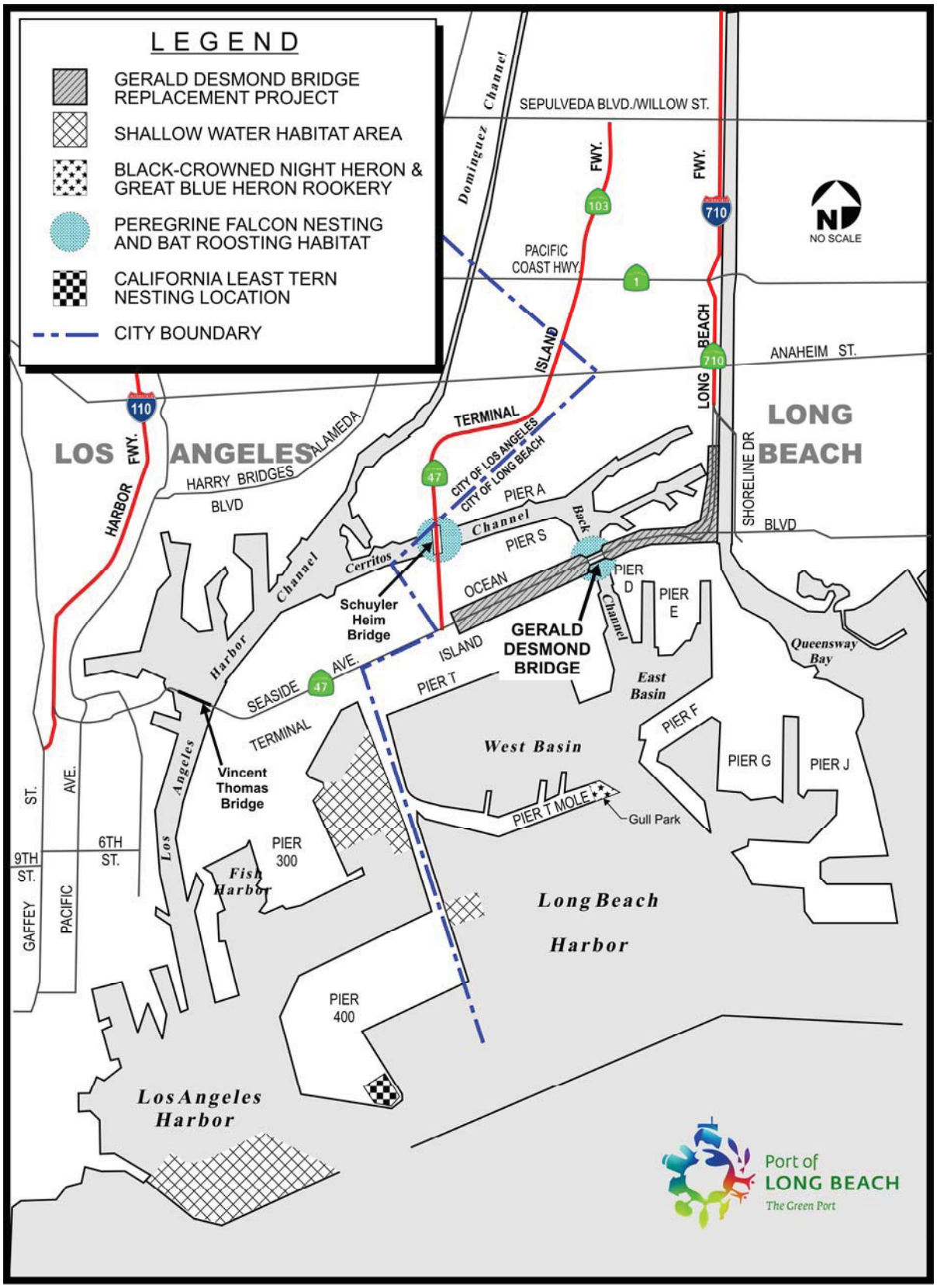

Exhibit 2.3.1-2
Sites of Sensitive Habitats in the Area of the Gerald Desmond Bridge Replacement Project

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- Conflict with any other federal policies or ordinances protecting biological resources, such as the Migratory Bird Treaty Act of 1918 (MBTA).

No Action Alternative

No natural communities of concern were identified within the study area. Under the No Action Alternative, the existing bridge would continue to be in service, and no construction activities would occur. The No Action Alternative would not affect any sensitive natural communities.

Construction and Demolition Impacts

North and South-side Alignment Alternatives

No natural communities of concern were identified within the BSA. Construction of these alternatives would not affect any sensitive natural communities.

Rehabilitation Alignment Alternative

No natural communities of concern were identified within the BSA. Construction of the Rehabilitation Alternative would have no effect on sensitive natural communities.

Operational Impacts

North- and South-side Alignment Alternatives

No natural communities of concern were identified within the BSA. Operation of these alternatives would not affect any sensitive natural communities.

Rehabilitation Alignment Alternative

No natural communities of concern were identified within the BSA. Operation of the Rehabilitation Alternative would have no effect on sensitive natural communities.

2.3.1.4 Avoidance, Minimization and/or Mitigation Measures

No measures are required.

2.3.2 Wetlands and Other Waters

2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the CWA (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be substantially degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by EPA.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as FHWA, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds that (1) there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by CDFG and RWQCBs. In certain circumstances, the CCC (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, then a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. See Section 2.2.1 (Water Resources and Hydrology) for additional details.

2.3.2.2 Affected Environment

Wetlands do not occur within the project area; therefore, no wetlands will be affected by this project. More information on effects to water resources within the Cerritos Channel, Back Channel, and Dominguez Channel is discussed in the Section 2.2.1 (Water Resources and Hydrology). Effects to marine life within the study area are discussed in Sections 2.3.3.2 (Marine Communities and Plants [Algae]) and Section 2.3.4.2 (Marine Animals and Plankton).

2.3.2.3 Environmental Consequences

Evaluation Criteria

The criterion below is the basis for evaluating whether there are substantial adverse effects to wetlands and other waters resulting from project development. Would the project:

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

No Action Alternative

Under the No Action Alternative, the existing bridge would continue to be in service and no construction activities would occur. The No Action Alternative would not affect any wetlands or other waters of the U.S.

Construction and Demolition Impacts

North- and South-side Alignment Alternative

No wetlands were identified within the BSA, and all construction activities would be located outside of the Back Channel. The North- and South-side Alignment Alternatives would have no effect on wetlands or other waters of the U.S.

Rehabilitation Alternative

No wetlands were identified within the BSA, and all construction activities would be located outside of the Back Channel. The Rehabilitation Alternative would have no effect on wetlands or other waters of the U.S.

Operational Impacts

North- and South-side Alignment Alternative

Operation of the North- and South-side Alignment Alternatives would have no effect on wetlands or other waters of the U.S.

Rehabilitation Alternative

Operation of the Rehabilitation Alternative would have no effect on wetlands or other waters of the U.S.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

No measures are required.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

USFWS and CDFG share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the ESA and/or the California Endangered Species Act (CESA). See Section 2.3.5 (Threatened and Endangered Species) for detailed information regarding these species.

This section of the document discusses all of the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for ESA can be found at 16 U.S.C. Section 1531, *et. seq.* (see also 50 CFR Part 402). The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, *et. seq.* Port projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and CEQA, PRC Sections 2100-21177.

2.3.3.2 Affected Environment

Terrestrial Plant Communities

Overall, the BSA’s terrestrial habitats are developed and industrialized in the form of container terminals and ancillary port uses on Terminal Island and Pier D; therefore, native vegetation communities that once occurred in the area are fragmented and disturbed.

Other than a few isolated areas of ornamental plantings, vegetation consists of exotic (non-

native) annual weeds that proliferate at curbs and asphalt cracks with occasional ornamental tree species. This habitat type is termed ruderal-disturbed (termed *non-native grasslands* by Holland, 1986; *annual grassland series* by Sawyer and Keeler-Wolf, 1995).

The following was observed during surveys of the BSA on October 25, 2002:

- A row of approximately 15 introduced evergreens (*Pinus*[10] spp.) is present along the roadway at the corner of SR 710 and Ocean Boulevard, west of Pico Avenue on the north side of the approach to the bridge. Approximately 20 ft (6 m) high, these pines line the north side of a triangular property at this location.
- On either side of the bridge, the shoulders of Ocean Boulevard are vegetated with eucalyptus (*Eucalyptus* spp.), a non-native tree common in the California landscape. Approximately 11 mature fan palms (*Washingtonia* spp.) roughly 50 ft (15 m) high are located along the south shoulder of Ocean Boulevard at the west end of the bridge. Other exotic plants observed at various locations included iceplant (*Carpobrotus* spp.), oleander (*Nerium oleander*), tree tobacco (*Nicotiana glauca*), and non-native yucca (*Yucca* spp.).
- Fan palms are also found at the northeast and southeast approach to the bridge on the shoulders of Ocean Boulevard.
- The northern facing underside of the bridge east of the Back Channel contains a steep, sloped road shoulder across from the LBGS. This sandy, sloped face is vegetated with exotic weedy species that include horseweed (*Conyza canadensis*) and an isolated fan palm. Surface water runoff has eroded this area, and it is highly disturbed from debris that falls from the bridge above. This sloped face does not appear to have been treated for erosion control or otherwise landscaped, setting it apart from other soil surfaces within the zone of effect.
- Vegetation along the eastern edge of the Back Channel, observed from Pier D Avenue under the bridge, was limited to isolated plantings used for landscaping (*Crassula* spp. and oleander). Exotic weedy species and annual grasses are growing through cracks in asphalt, concrete, and riprap sidewalls on the west side of the Back Channel north of the bridge.

Marine Communities and Plants (Algae)

Marine communities in the BSA are limited to open water on the surface, benthic (the harbor floor), and pelagic[11] (between the surface and the harbor floor), as well as human-created habitats such as riprap. Kelp and macroalgae are anchored in the benthic community, but they extend into the pelagic and open water community. Kelp and macroalgae are narrowly distributed within the BSA because they are restricted principally to shallow hard-bottom environments associated with riprap shorelines, breakwaters, pier structures, and other harbor debris. Riprap supports giant kelp communities in the Outer Harbor; and riprap habitat occupies much of the shoreline under the bridge and the remainder of the BSA. Some kelp habitat is present in the BSA, particularly in the Back Channel near the bridge.

2.3.3.3 Environmental Consequences

Evaluation Criteria

The following criterion is the basis for evaluating whether there are substantial adverse effects to plant species resulting from project development. Would the project:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in any federal plans, policies, or regulations, or by USFWS.

No Action Alternative

Under the No Action Alternative, the existing bridge would continue to be in service and no construction activities would occur. The No Action Alternative would not affect any terrestrial or marine plant communities.

Construction and Demolition Impacts

North-side Alignment Alternative

Terrestrial Plant Communities and Habitat. Construction of the proposed project would not

[10] Scientific names are provided only after the first mention of the common name for the species in this section. Scientific nomenclature and common names follow taxonomy, and nomenclature in this report follow Hickman (1993) for plants, Robins *et al.* (1991) for fish, Committee on Standard English and Scientific Names (2003) for herpetofauna, American Ornithologists' Union (1983; 1998) for birds, and Wilson and Cole (2000) for mammals.

[11] Occurring in or over the open ocean.

result in direct effects on any natural terrestrial communities. The proposed widening of Ocean Boulevard on Terminal Island and on Pier D would occur entirely within developed areas that are devoid of natural habitats. Installation of new transmission towers would include placement of towers alongside the existing towers on Pier A in a developed area devoid of natural habitat. No loss of habitat would be expected because of construction, operation, or demolition activities.

Marine Plant Communities and Habitat. All construction would occur outside of the channel. No substantial effects on marine plant communities or habitat is anticipated.

South-side Alignment Alternative

Construction and demolition effects associated with the South-side Alignment Alternative would also occur in areas devoid of natural habitats and outside of the channel. Construction and demolition effects would be the same as those described under the North-side Alignment Alternative.

Rehabilitation Alternative

Work required to rehabilitate the existing bridge would occur within the current bridge footprint and outside of the channel. Bridge rehabilitation activities would not affect terrestrial or marine plant communities or habitats.

Operational Impacts

North- and South-side Alignment Alternatives

Neither the North- nor South-side Alignment Alternative would result in operational effects to terrestrial or marine plant communities.

Rehabilitation Alternative

The Rehabilitation Alternative would not result in any operational effects to terrestrial or marine plant communities.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

No measures are required.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many state and federal laws regulate effects to wildlife. USFWS, the National Oceanic and Atmospheric Administration (NOAA) Fisheries and CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under CESA or ESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5 (Threatened and Endangered Species). All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- NEPA
- MBTA
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- CEQA
- Sections 1600 through 1603 of the Fish and Game Code
- Sections 4150 and 4152 of the Fish and Game Code

2.3.4.2 Affected Environment

Terrestrial Animals

As described above, the BSA is dominated by a ruderal/disturbed plant community[12]; therefore, terrestrial wildlife species in the BSA are limited to species well-adapted to this type of human-modified community. Such species include house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), feral cat (*Felis domesticus*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), American crow (*Corvus corax*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*) (U.S. Navy/City of Long Beach, 1998).

Despite the lack of native plant communities, 18 bird species are known to nest within the harbor area, including the California least tern (*Sternula antillarum browni*), great blue heron (*Ardea herodias*), black-crowned night heron (*Nycticorax nycticorax*), and black oystercatcher (*Haematopus bachmani*) (MEC, 2002). From 1997 through 2005, Caspian terns (*Sterna caspia*), elegant terns (*Sterna elegans*), and, during some years,

[12] Assemblages of plant species living in an area under the same or similar biological and environmental factors. Plant community categories discussed in this report are based on Holland (1986), although Zeiner *et al.* (1988; 1990a; 1990b), and Sawyer and Keeler-Wolf (1995) were also used.

black skimmer (*Rhynchops niger*) also nested within the harbor area (MEC, 2002; Keane Biological Consulting, 2007); however, aside from nesting by these species on barges in the outer Long Beach Harbor during 2006 and 2007, no terns other than California least terns have nested in the harbor area since 2005 (Keane Biological Consulting, 2007). These species are further discussed under Special-Status Species[13].

Within the BSA, nesting bird species are limited to great blue heron and black-crowned night heron in Gull Park at the end of the Navy Mole. Nesting by double-crested cormorants (*Phalacrocorax auritus*) has also been documented during previous years on the transmission towers of Piers S and A north of the Gerald Desmond Bridge (U.S. Navy/City of Long Beach, 1998). The BSA also provides nesting opportunities for house sparrows on light poles and in eaves, American crows in trees and tall buildings, and American kestrels (*Falco sparverius*), which commonly use cavities in structures and under dead palm tree leaves. Habitat for several species of marine birds is also present in the BSA, although some of these, such as gulls, commonly roost or forage on land. These are discussed under Marine Animals and Plankton, following this section.

A pair of peregrine falcons has nested within the supporting structure below the Gerald Desmond Bridge off and on for the past several years, and they have successfully fledged young each year (Sipple, 2006). Peregrine falcons have also nested on the Schuyler Heim Bridge, which separates the Ports inner harbors (MEC, 2002). Peregrine falcons and other special-status species of the harbor area are further discussed in Section 2.3.5 (Threatened and Endangered Species).

Terrestrial wildlife observed during the October 25, 2002, survey and July 31 through August 2, 2003, survey included grebes (*Podiceps* spp.), gulls (*Larus* spp.), northern mockingbird (*Mimus polyglottos*), European starling, and house sparrow. Other terrestrial birds expected to occur in the BSA include American kestrel, mourning dove, Anna's hummingbird (*Calypte anna*), barn swallow (*Hirundo rustica*), American crow, and house finch. Several birds associated with marine habitats were also observed during surveys; these are discussed under Marine Animals and Plankton, following this section.

The MEC (2002) surveys recorded foraging by 8 percent of all birds observed in the Inner Harbor that includes the BSA, compared to 13 percent in the outer Long Beach Harbor (MEC, 2002), suggesting that the abundance and/or diversity of prey for birds is lower in the Inner Harbor and BSA than the Outer Harbor. Bats were observed during the July 31 through August 2, 2003, surveys, and although they could not be identified to species, bat specialist Stephanie Remington determined that they were most likely *Myotis.* Because they were observed only in singles or pairs and the understructure of the bridge is not conducive to support large numbers of bats, roosting bat colonies are unlikely (see Section 2.3.5 [Threatened and Endangered Species]).

No other terrestrial mammals, amphibians, or mammals were observed during the field surveys; however, Norway rat, house mouse, opossum (*Didelphis virginiana*), and feral cat are expected to be present in the BSA, and several species of bats may roost on the bridge and/or forage in the BSA.

Marine Animals and Plankton

Although the Port is a highly industrialized setting, the Long Beach, and adjacent Los Angeles, harbor (harbor area) supports marine habitats encompassing a range of species. More than 130 fish species have been collected in the harbor area, and several of them use the harbor area as a nursery (MEC, 2002). The open water and other habitats of the Outer Harbor support important nesting, foraging, and resting habitat for numerous avian species. More than 100 species of birds forage and roost in the various habitats within the Ports. Some of these species are year-round residents of the area; others may winter inside the Ports (MEC, 2002). Some of these are special-status species, which are further discussed under Special-Status Species. Within the BSA, habitat for marine animals is limited, as described below.

Riprap habitat, which is present under the bridge, provides substrate for a variety of sessile invertebrates (MEC, 2002). Other marine organisms that potentially occur in the harbor area include marine mammals, marine birds, sea turtles, fish, benthic and epibenthic invertebrates, and plankton (MEC, 2002), which are further discussed below.

[13] Species that have been afforded special recognition by state and federal resource agencies and resource conservation organizations due to declining or limited population sizes.

Marine Mammals. Whales have been observed in the outer waters beyond the breakwaters and very rarely in the Outer Harbor. The California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*) are commonly observed within the harbor. The bottle-nosed dolphin (*Tursiops truncatus*) has also been observed in the outer harbor (MEC, 2002); however, due to marine vessel traffic, observance of marine mammals is less common in the BSA than in the outer harbor.

Marine Birds. The open water and other habitats in the harbor area support nesting, foraging, and resting habitat for numerous bird species. Some bird species are present year-round, while others are seasonal (i.e., winter or summer breeders) or seasonal migrants, remaining only for a few days each year. More than 100 bird species have been documented foraging and roosting in the harbor (MEC, 2002). Of these, 69 are considered saltwater-obligates and dependent on the waters of the harbor for food and cover. During MEC's 2000-2001 surveys (MEC, 2002), 99 species were observed. Gulls were the most abundant birds, followed by terns and pelicans, waterfowl, and upland birds (dominated by rock doves). Shorebirds and marshbirds were the least numerous birds in the harbor area.

Sea Turtles. Sea turtles are infrequently seen in the harbor. Most sightings have been of the green sea turtle (*Chelonia mydas*), but loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) turtles have occasionally been seen (MEC, 2002). Sea turtles are further discussed under Special-Status Species.

Fish. The five most-abundant species of fishes occurring in the Los Angeles-Long Beach Harbor are northern anchovy (*Engraulis mordax*), white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), Pacific sardine (*Sardinops sagax*), and topsmelt (*Atherinops affinis*) (MEC, 2002). These five species account for nearly 92 percent of the total fish population in the harbor. Other abundant species include specklefin midshipman (*Porichthys notatus*), arrow goby (*Clevelandia ios*), yellowfin goby (*Acanthogobius flavimanus*), California halibut (*Paralichthys californicus*), shiner surfperch (*Cymatogaster aggregata*), diamond turbot (*Hypsopsetta guttulata*), speckled sandab (*Citharichthys stigmaeus*), salema (*Xenistius californiensis*), barred sand bass (*Paralabrax nebulifer*), and bat rays (*Myliodatis californica*). Seventy-six (76) taxa, representing 74 species, were collected during the baseline study (MEC, 2002).

Benthic and Epibenthic Invertebrates. The MEC 2000-2001 surveys documented 400 taxa, representing 361 species, of infauna in the Los Angeles-Long Beach Harbor (MEC, 2002). Infauna are marine invertebrates that live in soft sediments – a community is dominated by polychaetes (i.e., sand, tube, and clamworms), which comprise approximately 65 percent of the infaunal population in the harbor. Crustaceans (i.e., crabs and shrimp) comprise 23 percent, mollusks (i.e., clams, mussels, and snails) comprise 9 percent, echinoderms (i.e., starfish, sea urchins, sand dollars, and sea cucumbers) comprise less than 1 percent, and other minor phyla make up 2 percent of the infaunal community. Benthic organisms found in the harbor include polychaete worms, bay mussels, barnacles, limpets, and algae. Dominant species of macroinvertebrates include the black spotted shrimp (*Crangon nigromaculata*), tuberculate pear crab (*Pyromaia tuberculata*), Xantus' swimming crab (*Portunus xantusii*), and invasive species including the introduced New Zealand bubble snail (*Potamopyrgus antipodarium*) and Spotwrist hermit crab (*Pagurus spilocarpus*) (MEC, 2002).

Plankton. Plankton is most abundant in mid-spring and early autumn. Diatoms and dinoflagellates are the dominant phytoplankton. Zooplankton is characterized by high concentrations of copepods. The Los Angeles-Long Beach Harbor area is considered a nursery for fish and ichthyoplankton (i.e., planktonic fish eggs and larvae) in comparison to open coastal waters (MEC, 2002).

2.3.4.3 Environmental Consequences

Evaluation Criteria

The criteria shown below are the basis for evaluating whether there are substantial adverse effects to animal species resulting from project development. Would the project:

- Conflict with any federal policies or ordinances protecting biological resources, such as the migratory bird protection regulations.
- Interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural

community identified in any federal plans, policies, or regulations, or by USFWS.

No Action Alternative

Under the No Action Alternative, the existing bridge would continue to be in service, and no construction activities would occur. The No Action Alternative would not affect any terrestrial or marine animal species or habitats.

Construction and Demolition Impacts

North-side Alignment Alternative

Terrestrial and Marine Habitats and Species

- **Terrestrial Wildlife.** As discussed in Section 2.3.4.2, common terrestrial wildlife species in the BSA are generally well adapted to construction and other human activities. They are expected to avoid construction vehicles; however, some mortality of terrestrial wildlife species, including primarily non-native species (e.g., rock doves and opossums) and some native species (e.g., American crows and house finches) may result due to project construction activities (e.g., effects with construction vehicles or due to removal of ruderal-disturbed vegetation adjacent to the existing bridge or related structures). The potential for increased mortality of common terrestrial wildlife would not be considered a substantial effect because the likelihood of occurrence is low and species are considered generally abundant within the project vicinity. Additionally, because the terrestrial species in the BSA are primarily well adapted to human-modified habitat and disturbances, noise and vibration generated by construction activities are not expected to result in any substantial effects on terrestrial wildlife of the BSA.

- **Marine Wildlife.** The proposed project would be constructed without dredging or other intrusion in the Back Channel of the Inner Harbor. No pilings or piers would be placed into Back Channel waters. New bridge piers and footings would be constructed on land on either side of the bridge along Ocean Boulevard. Towers for new transmission lines would be placed on land; no work would be conducted within the Cerritos Channel. No construction in the marine environment would be required, and no direct effects on marine wildlife during construction are anticipated. Additionally, marine animal species in the waterways of the BSA are not expected to be affected by the noise and vibration generated by project construction activities due to the prevalence of noise and vibration from existing container shipping and other human activities in those waterways. Similarly, marine birds (i.e., gulls, terns, skimmers, marine waterfowl) would likely avoid the BSA during construction due to higher levels of construction disturbance. It is possible that some mortality of marine wildlife species may occur during construction; however, this would not be considered a substantial effect because gulls (even California gulls, a California Species of Special Concern [CSSC]) are numerous in the BSA and its vicinity. Construction and demolition effects on marine animals resulting from the proposed project are not expected to be substantial.

- **Marine.** BMPs that are part of the Port's construction protocol would be implemented to prevent construction debris, litter, and sediment from entering the channel. No indirect effects to marine biological resources are anticipated to result from construction of the project.

South-side Alignment Alternative

Construction and demolition impacts to terrestrial and marine habitats and species would be the same under the South-side Alignment Alternative as described under the North-side Alignment Alternative.

Rehabilitation Alternative

All work required for the Rehabilitation Alternative would occur within the existing footprint of the Gerald Desmond Bridge. As previously discussed, terrestrial wildlife species in the BSA are primarily species well adapted to human-modified habitat and disturbances; therefore, construction disturbance (e.g., vibration, noise, construction equipment) resulting from bridge rehabilitation activities are not expected to result in substantial construction effects on terrestrial or marine habitats or species.

Operational Impacts

North-side Alignment Alternative

Direct Impacts of Project Operation on Terrestrial and Marine Habitats and Species

Project operation includes use of the bridge by traffic and bridge maintenance (i.e., painting, repairs). No direct effects on marine communities (i.e., loss of marine habitat, mortality of marine animals due to collisions with vessel traffic) are expected to occur during project operation. No direct effects on existing terrestrial and marine

habitats or species due to project operation and maintenance are anticipated.

Indirect Impacts of Project Operation on Terrestrial and Marine Habitats and Species

Several wildlife and marine species use the BSA and its vicinity. Use of the BSA and its vicinity by terrestrial and marine species is expected to continue similar to its current level. The new bridge would support higher levels of traffic, which could result in higher levels of noise, air, and water pollutants. Because of project mitigation measures that would reduce air and water pollutants, and the fact that wildlife and marine species of the BSA and its vicinity are tolerant of operational effects due to traffic, indirect effects of project operation on terrestrial and marine habitats and species due to possible increased noise and pollutants are not expected to be substantial (see also Section 2.3.6 [Invasive Species]).

South Side-Alignment Alternative

Operational impacts to terrestrial and marine habitats and species would be the same under the South-side Alignment Alternative as described under the North-side Alignment Alternative.

Rehabilitation Alternative

The Rehabilitation Alternative would result in seismic improvements to the Gerald Desmond Bridge. No operational impacts to terrestrial and marine habitats and species are anticipated.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

No measures are required for common terrestrial and marine habitats and species; see Section 2.3.5.4 for mitigation/minimization measures regarding Threatened and Endangered Species.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the ESA: 16 U.S.C., Section 1531, *et seq.* (see also 50 CFR Part 402). This Act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this Act, federal agencies, such as FHWA, are required to consult with USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of ESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, California Fish and Game Code, Section 2050, *et seq.* The CESA emphasizes early consultation to avoid potential effects to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. CDFG is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions, an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the ESA, CDFG may also authorize effects to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

A plant or wildlife species is defined as having “special status” when it has been afforded recognition by federal, state, or local resources conservation agencies (e.g., USFWS, CDFG), and/or resource conservation organizations (e.g., CNPS or National Audubon Society). Special-status species include:

- Species officially listed as threatened or endangered species (TES) or proposed for such listing under ESA or CESA.
- Species considered a candidate for possible listing under CESA or ESA.
- Species listed as CSSC, which are animal species with declining or limited populations, or with restricted nesting requirements. Separate lists for birds, amphibians and reptiles, and mammals were developed by CDFG with input, respectively, from Remsen (1978), Jennings and Hayes (1994), and Williams (1986). These documents provide information

on the distribution[14] and habitat preferences for special-status species.

- Species considered rare or in danger of extinction by non-governmental agencies, including CNPS or National Audubon Society.
- Species considered a Bird of Conservation Concern by USFWS (USFWS, 2002a).

Several other lists of special-status species are maintained by other governmental agencies (i.e., United States Forest Service, United States Bureau of Land Management, and California Department of Forestry), but they were not considered in this report because these agencies have no jurisdiction in the BSA.

2.3.5.2 Affected Environment

Study Methodology and Special-Status Species Search Results

The study methodology included consultation with sate and federal resource agencies and review of available literature. CDFG, USFWS, POLA, and POLB were contacted to obtain pertinent information, including direct contact or indirect contact through Internet databases. A listing of threatened, endangered, and candidate species has been acquired from the USFWS Carlsbad and Ventura Field Offices, which share joint jurisdiction over Los Angeles County. CDFG has been contacted regarding the occurrence of special-status species within the project area. As recommended by CDFG, a search for the California Natural Diversity Database (CNDDB) and the CDFG home page provided identification of state threatened, endangered, and special-status species. Additionally, the database for rare plants was reviewed.

Several special-status species are reported by the CNDDB for the United States Geological Survey (USGS) Long Beach quadrangle; however, as noted previously, the BSA's terrestrial habitats are degraded to such a degree that they provide little value for native plants or wildlife. Most special-status species identified by the CNDDB within the USGS Long Beach quadrangle, which includes the BSA, are not likely to be present because (1) species-specific habitat requirements are not present; (2) species are transitory and occur in the area rarely during migration; and (3) species are not tolerant of disturbance or proximity to human activities that are currently present in the BSA. Tables 2.3.5-1 and 2.3.5-2 summarize only special-status species known or expected to occur in the BSA or its vicinity (i.e., in the City of Long Beach or in the harbor area) based on the results of the literature reviews and field reconnaissance surveys. No special-status terrestrial natural communities are listed for the USGS Long Beach quadrangle.

In summary, special-status species of the BSA are limited to the state-listed peregrine falcon, CSSC double-crested cormorant, and several CSSC bat species that may be considered routine residents of the BSA (Exhibit 2.3.1-1). Other special-status species that may use the BSA occasionally for foraging include the federally and state-listed California brown pelican and California least tern; however, even these species generally forage at locations distant from the BSA.

2.3.5.3 Environmental Consequences

Evaluation Criteria

The following criterion is the basis for evaluating whether there are substantial adverse effects to plant species resulting from project development:

- An adverse impact to natural resources would involve the loss of the TES plant or wildlife species, or degradation of their habitat.

No Action Alternative

The No Action Alternative would not result in any effects on TES in the project area.

Construction and Demolition Impacts

North-side Alignment Alternative

Peregrine Falcon: During construction of the North-side Alignment Alternative, no work would occur on the existing bridge until the final demolition stage of construction. During most of this project (approximately 48 months of the 60-month schedule), existing peregrine nesting ledges would be available for use. Use of the existing perches may be affected by construction disturbances (i.e., noise and vibration or visual disturbances) and, although not anticipated, could result in nest abandonment. Major construction associated with the main span, including pile driving and bridge deck construction, would occur within the vicinity of the existing ledge locations. Bridge deck and pile driving construction activities would occur within approximately 50 ft (15 m) and 300 ft (91 m), respectively. Due to the existing nesting ledge location (i.e., beneath Gerald Desmond Bridge in substructure [see Exhibit 2.3.5-1]), construction activities would be mostly screened from view by the existing bridge because the new bridge deck would be

[14] The geographic limits that define the total area occupied by a given species.

Table 2.3.5-1
Special-Status Plant Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Scientific Name and Common Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	USFWS	CDFG CNPS		
southern tarplant *(Centromadia parryi ssp. australis)*	--	1B	Occurs in coastal salt and freshwater estuary edges; seasonally and in disturbed soils near saltwater; known to occur in the City of Long Beach near the Marine Stadium (Keane Biological Consulting, 2007; flowers May-November (CNPS, 2002; CDFG, 2002a).	No suitable habitat[15] in the BSA.

1B: rare, threatened, or endangered in California or elsewhere (CNPS, 2001).

Table 2.3.5-2
Special-Status Wildlife Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Common Name and Scientific Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	Federal USFWS	State CDFG		
Reptiles				
Leatherneck turtle *(Demochelys coriacea)*	FE	--	Occasionally observed off the southern California coast.	May occur rarely in the Outer Harbor and very rarely in the Inner Harbor.
Loggerhead turtle *(Caretta caretta)*	FT	--	Most abundant turtle observed off the coast of southern California.	May occur rarely in the Outer Harbor and very rarely in the Inner Harbor.
Green turtle *(Chelonia mydas)*	FE for Florida & Mexico breeding sites; FT other areas	--	Nests on Pacific coast beaches of Baja California, Mexico, occasionally observed off southern California coast.	Observed in Long Beach Alamitos Bay. Observed occasionally in the Outer Harbor and expected rarely in the Inner Harbor.
Olive ridley turtle *(Lepidochelys olivacea)*	FE for Mexico breeding sites; FT other areas	--	Nests on Pacific coast beaches of Baja California, Mexico, occasionally observed off southern California coast.	May occur rarely in the Outer Harbor and very rarely in the Inner Harbor.

[15] A place exhibiting optimal environmental conditions for support of a given species. Availability of suitable habitat is critically important to species that are sedentary, especially invertebrates. The presence of species with high mobility, such as flying insects and birds, may not necessarily infer presence of suitable habitat. For example, gulls are often observed in vehicle parking lots, but this does not imply that parking lots are suitable habitat. The same is true for raptors and other predators, which may forage over a variety of areas to exploit hunting opportunities, or big game, which require large areas to support a range of seasonal diets.

Table 2.3.5-2
Special-Status Wildlife Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Common Name and Scientific Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	Federal USFWS	State CDFG		
Birds				
Common loon *(Gavia immer)*	--	CSC	Winters along the California coast, including harbors and estuaries; nests in Canada and Alaska; no nesting in southern California.	Occasionally observed swimming and foraging in the Outer Harbor (MEC, 2002)
California brown pelican *(Pelecanus occidentalis californicus)*	FE BCC	SE CFP	Forage in West Basin; colonial ground-nester in isolated, undisturbed coast beaches, offshore islands, and interior lake margins; forages for fish in fresh, brackish, or marine waters (U.S. Navy/City of Long Beach, 1998; MEC, 2002; Shields, 2002).	Foraging and day-resting habitat present; individuals may be observed in project area.
double-crested cormorant *(Phalacrocorax auritus)*	---	CSC	Prefers coasts, inland lakes, and estuaries for foraging; nests on offshore islands and on tall mainland trees and structures. Nests on transmission towers at Piers S and A in the BSA (Exhibit 2.3.1-2); also forages throughout the harbor area waters. A total of 78 (and a maximum of 13) individuals was observed in the Back Channel of the BSA during 2000-2001 surveys (MEC, 2002).	Suitable nesting habitat present; Back Channel and Cerritos Channel also provides foraging habitat, but better foraging habitat present in Outer Harbor.
great blue heron *(Ardea herodias)*	--	--	Colonial nester; nests in tall trees, including palm trees; forages on fish and other marine animals, as well as small terrestrial mammals; observed nesting at Gull Park in the Navy Mole (Exhibit 2.3.1-2) (U.S. Navy/City of Long Beach, 1998). 8 nests at Gull Park in 2006 and 2007 (MBC, 2007).	No nesting habitat present in BSA; some foraging and roosting habitat present; individuals may be observed occasionally foraging in BSA.
black-crowned night heron *(Nycticorax nycticorax)*	--	--	Former nesting colony at Gull Park in the Navy Mole (Exhibit 2.3.1-2) (U.S. Navy/ City of Long Beach, 1998; MEC, 2002). 423 nests in 2000, 81 nests in 2001 during Navy soil remediation activities; no nesting at Gull Park since 2002 due to Navy disturbance (MBC, 2007). Nesting was also observed in ficus trees adjacent to the Vincent Thomas Bridge during 2008 surveys for POLA.	No nesting habitat present in BSA; only foraging and roosting habitat present, may occasionally forage in Back Channel and Cerritos Channel.
American peregrine falcon *(Falco peregrinus anatum)*	BCC	SE[16]	Resident; documented as using the Gerald Desmond and Schuyler Heim bridges for nesting (Exhibit 2.3.1-2) since 1993; assumed to have occupied project area since the 1980s (U.S. Navy/City of Long Beach, 1998; MEC, 2002).	Known nesting habitat present in BSA; also expected to forage on rock doves in BSA and occasionally on marine birds in Back Channel.

[16] On August 6, 2009, the California Fish and Game Commission voted to remove the peregrine falcon from the State's list of endangered species. Currently, the ruling is under review by the State Office of Administrative Law. Pending approval of the ruling, the peregrine falcon would be removed from the endangered species list, but it would remain a "fully protected" species. The final ruling on the matter may or may not result in a change in either the impact findings and/or proposed mitigation pertaining to the species. This information is expected to be available in time for inclusion in the final environmental document.

Table 2.3.5-2
Special-Status Wildlife Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Common Name and Scientific Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	Federal USFWS	State CDFG		
western snowy plover *(Charadius alexandrinus nivosus)*	FT BCC	CSC	Prefers undisturbed sandy marine or estuary beaches, shores of large alkali lakes; may use road shoulders or salt pond levees; nests on fine gravel (Page *et al.,* 1995; U.S. Navy/City of Long Beach, 1998; MEC, 2002). Occasionally observed as a migrant at Pier 400 (Keane Biological Consulting, 2007).	No suitable nesting or foraging habitat in BSA.
black oystercatcher *(Haematopus bachmani)*	BCC	--	Nests on rocky offshore islands, including a nesting colony on the Outer Harbor breakwater (U.S. Navy/City of Long Beach, 1998; MEC, 2002). Observed foraging on riprap in several areas of the harbor (MEC, 2002).	No nesting habitat present in BSA; some foraging habitat along riprap of BSA.
Long-billed curlew *(Numenius americanus)*	--	CSC (nesting habitat)	Winters along the California coast. Nests in northeastern California and north; no nesting in southern California. Forages in fields, mudflats, and sometimes on riprap (MEC, 2002).	Occasionally observed foraging on riprap at the Seaplane Lagoon west of the Navy Mole (MEC, 2002).
California gull *(Larus californicus)*	--	CSC (nesting habitat)	Small numbers present year-round on the California coast. Forages in open ocean, harbors, and estuaries. Nests at Mono Lake, northeastern California, and further north; no nesting in southern California.	Observed in the Outer and Inner Harbors, including more than 50 individuals in the Inner Harbor including the BSA (MEC, 2002).
Caspian tern (nesting colony) *(Sterna caspia)*	BCC	--	Colonial nesting species; formerly nested (1997-2005) near the least tern nesting site on Pier 400 in the Los Angeles Harbor (Keane Biological Consulting, 2007); forages in harbor waters. 27 individuals observed in Back Channel over 20 surveys (MEC, 2002). 53 Caspian terns successfully nested on “Arctic Challenger” barge in Long Beach Harbor in 2007 (Ross, 2007).	Aside from occasional use of harbor barges for nesting, no nesting habitat is present in BSA; some foraging and roosting habitat present; individuals may occasionally forage in Back Channel and Cerritos Channel.
elegant tern *(Sterna elegans)*	BCC	CSC	Colonial nesting species with relatively restricted distribution; 90 percent of total population breeds in 5 southern California sites (U.S. Navy/City of Long Beach, 1998; Burgess *et al.,* 1999; MEC, 2002). Formerly nested (1998-2005) near the least tern nesting site on Pier 400 in the Los Angeles Harbor; occasionally forages the harbor, but primarily outside harbor; 2 individuals observed in Back Channel over 20 surveys (MEC, 2002). High numbers use breakwater and adjacent harbor waters for foraging with newly fledged young late June to early August.	Aside from unsuccessful nesting on harbor barges in 2006, no nesting habitat is present in BSA; some foraging and roosting habitat present in Back Channel and Cerritos Channel.

Table 2.3.5-2
Special-Status Wildlife Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Common Name and Scientific Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	Federal USFWS	State CDFG		
California least tern *(Sternula antillarum browni)*	FE BCC	SE	Breeds on Pacific coast from San Francisco Bay to southern Baja California, Mexico, and forages offshore and in harbors, bays, and estuaries. Preferred nesting habitat is sandy beaches and mudflats bordering shallow water in estuaries (Thompson *et al.,* 1997; CDFG, 2002a). Nests in a protected nesting site on Pier 4000 in the Los Angeles Harbor (Exhibit 2.3.1-2) and forages throughout the harbor area waters, including the Inner Harbor, as well as outside the harbor (Keane Biological Consulting, 2004).	No nesting habitat exists in BSA. Designated shallow-water habitat for least tern foraging present west of Pier T Mole and in a 26-acre (10-ha) area of shallow water adjacent to Pier 400, but forages in many areas of the harbor, including the East Basin, Cerritos Channel, and Back Channel (MEC, 2002) near the BSA.
black skimmer *(Rynchops niger)*	BCC	CSC	Nested 1998-2000 on Pier 400 in the Los Angeles Harbor; forages in harbor area waters of the Outer Harbor (U.S. Navy/City of Long Beach, 1998; MEC, 2002). Not observed in the Inner Harbor during 20 surveys in 2000-2001 (MEC, 2002).	No nesting habitat present in BSA; only foraging and roosting habitat present; individuals may be observed rarely foraging in Back Channel and Cerritos Channel.
western burrowing owl *(Athene cunicularia hypugea)*	BCC	CSC	Open, dry grasslands, deserts, scrublands, and open fields with low-growing, often non-native vegetation; dependent upon burrowing mammals, most notably of California ground squirrel *(Spermophilus beechyi),* for burrow nests; forages on small mammals and insects (Haug *et al.,* 1993; U.S. Navy/City of Long Beach, 1998; MEC, 2002). 5 individuals observed and live-trapped from the California least tern nesting area on Pier 400 in 2007 (Keane Biological Consulting, 2007).	No nesting or foraging habitat in BSA.
loggerhead shrike *(Lanius ludovicianus)*	FSC BCC	CSC	Prefers open habitats such as grasslands and deserts; also known to use golf courses, pastures, and suburban parks. Observed on riprap and dockpiling habitat of Inner Harbor during surveys for this report. Not observed nesting during the 2000-2001 surveys, but reported to nest in previous years within harbor area (USACE, 1984). This species' numbers in coastal southern California and throughout the United States have declined in recent years.	Little nesting habitat and some foraging habitat present in BSA; individuals may be occasionally observed perching and foraging in BSA.
Mammals				
Gray whale *(Eschrichtius robustus)*	Delisted as FE June 1994	--	Migrates off the coast of southern California November through February to and from wintering/birthing grounds in Baja California, Mexico.	Observed in Outer Harbor off Pier 400 July 2004 (Keane, 2007); expected rarely in the Outer Harbor and not at all in the narrow channels of the BSA.

Table 2.3.5-2
Special-Status Wildlife Species Potentially Present in the Gerald Desmond Bridge Biological Study Area

Common Name and Scientific Name	Status		General Habitat Requirements and Known Occurrence	Potential for Occurrence in the BSA
	Federal USFWS	State CDFG		
Blue Whale (Balaenoptera musculus)	FE	--	Migrates off the coast of southern California. Spends summers in Alaska and wintering/birthing grounds in southern California/ Baja California, Mexico.	Recently observed off the coast of Long Beach.
Townsend's big-eared bat *(Corynorhinus townsendii)*	--	CSC	Primarily occurs in humid coastal regions of California; occupies wide variety of habitats; roosts in caves, buildings, bridges; highly sensitive to human disturbance at roosting and maternity sites (Kunz and Martin, 1982).	Individuals may occasionally occur in BSA, roosting under the Gerald Desmond Bridge.
long-legged bat *(Myotis volans)*	--	WBWG	Commonly associated with forest communities above 4,000 ft (1,220 m); also forages from sea level to higher elevations in chaparral, coastal scrub habitats; roosts in rock crevices, buildings, under tree bark, in snags, mines, and caves (Warner and Czaplewski, 1984).	Individuals or small colonies may occasionally occur in BSA roosting under the Gerald Desmond Bridge.
Yuma bat *(Myotis yumanensis)*	--	WBWG	Optimal environments include open forests in proximity to bodies of water used for foraging; maternity colonies occur in caves, mines, crevices, buildings, and bridges. One of the most numerous bat species roosting under bridges in southern California.	Individuals or small colonies expected to occur in BSA, roosting under the Gerald Desmond Bridge; some foraging habitat also present in BSA.
Mexican free-tailed bat *(Tadarida brasiliensis)*	--	WBWG	One of the most widely distributed mammalian species in the Western Hemisphere. Uses caves and rock crevices on cliff faces for roosting. One of the most numerous bat species roosting under bridges in southern California.	Small to large colonies expected to roost under the Gerald Desmond Bridge; foraging habitat also present in BSA.

Federal Status:

FE: Listed as endangered under ESA
FT: Listed as threatened under ESA
BCC: Bird of Conservation Concern (USFWS, 2002a)

State Status:

SE: Listed as endangered under CESA
CFP: California Fully Protected Species
CSC: Species of concern as identified by CDFG
WBWG: A species of concern for the Western Bat Working Group, a conservation group comprised of organizations, agencies, and private individuals

Exhibit 2.3.5-1
Peregrine Falcon Nesting Ledge on the Existing Gerald Desmond Bridge

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approximately 50 ft (15 m) higher than the existing bridge deck. Construction disturbances would include the presence of equipment, noise, and humans in close proximity (i.e., less than 250 ft [76 m] [Parsons, 2008b]) to perches and/or nesting ledges frequented by peregrine falcons). Construction activity during the 1 to 2 months prior to initiating nesting (approximately January through February) could create sufficient disturbances for peregrines to seek alternate nesting sites within their territory. Other known nesting sites in the project environs include Schuyler Heim Bridge, Vincent Thomas Bridge, Koch Carbon, and Long Beach City Hall. Only the Long Beach City Hall location has been unused for the last several years, and the new bridge proposed to replace the Schuyler Heim Bridge will not have nesting ledges.

Peregrine falcons have demonstrated a high tolerance to human activities, including construction, and the falcons nest in urban settings throughout North America, and in particular on bridges (Bell *et al.,* 1996; Cade *et al.,* 1996). Early in the 1997 breeding season, biologists documented a move of resident peregrines from a nesting site on the Gerald Desmond Bridge to a new nesting site on the Schuyler Heim Bridge in response to construction activities on the Gerald Desmond Bridge (BioResource Consultants, 1998); however, it is rare for a peregrine falcon to abandon a nest due to construction disturbance (Sipple, 2006). It is unlikely that the effects of construction would substantially affect nesting productivity or overall behavior. Peregrine nesting and behavior would be monitored throughout construction of the project, and visual barriers or similar devices acceptable to CDFG would be installed, as necessary, to minimize construction disturbances to nesting peregrine falcons. If monitoring indicated that nesting attempts were being initiated but construction disturbance was discouraging nesting at the current ledges, then the Port, in coordination with CDFG, would install temporary ledges on the Gerald Desmond Bridge at locations that would minimize potential construction disturbance. Successful use of artificial nest boxes was documented in 1997, when a nesting pair of peregrine falcons was disrupted by construction on the Gerald Desmond Bridge. The pair almost immediately reinitiated nesting at a gravel-filled, artificial nesting box placed on an existing ledge of the Schuyler Heim Bridge (BioResource Consultants, 1998).

Construction disturbance could also result in shifts in perch preferences and increased aggressive territorial behaviors to neighboring peregrines or other species, including increased predation (Sipple, 2006).

New nesting ledges would be incorporated into the design of the new bridge. They would be installed last or their use would be excluded prior to completion of the new bridge. Once the new ledges and boxes are available for occupancy, and prior to demolition activities, CDFG exclusion devices would be used on existing nest sites. If upon completion of the new bridge no peregrines are nesting on the Gerald Desmond Bridge, then exclusion devices would be immediately installed under the supervision of a CDFG-approved raptor biologist prior to initiation of demolition of the old bridge. Otherwise, exclusion devices would be installed subsequent to the nesting and prior to the nest site selection seasons.

With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction or demolition effects associated with the North-side Alignment Alternative on the peregrine falcons.

Bats: As previously discussed, no work would occur on the existing bridge until the final demolition stage of construction. During most of this project (approximately 48 months of the 60-month schedule), existing roosts or other areas would remain available for use by bats. Additionally, it is anticipated that this alternative would be constructed mainly during daytime hours and would have little impact on night feeding or behaviors. It is possible that construction disturbance would result in abandonment of the Gerald Desmond Bridge. If this roost abandonment did occur, there are other suitable bridges and buildings within the Port area for the bats to utilize during construction.

All monitoring would be completed by a CDFG-approved bat biologist. Preconstruction surveys would be initiated approximately 1-year prior to construction. Surveys would focus on species identification, roosting areas, and roost characteristics. Surveys would include at least one breeding season. Information obtained during the surveys would provide necessary information for monitoring during construction, determining roost characteristics for re-creation on the new bridge and species information to determine if additional coordination with CDFG is necessary. If CDFG sensitive bat species are present on the bridge, then the Port would coordinate with CDFG regarding species observations and incorporate additional measures to minimize effects on the species, as applicable.

Monitoring during construction would be completed to document construction effects on bats. If CDFG sensitive species are present, then monitoring would focus on those species, and depending on the bat response, additional coordination with CDFG or measures to minimize construction disturbance on sensitive species may be required.

Bat boxes and/or bat friendly engineering features would be installed/incorporated into the new bridge and would be available for bat occupancy prior to excluding bats from the existing bridge before demolition. Roost information obtained during monitoring would be utilized in recreating roosts on the new bridge. Once the new boxes are installed, bat exclusion could begin at all areas, except at maternity roosts. If feasible, all exclusion would occur before or after the bat breeding season. If maternity roosts are present, then bat exclusion would not occur at these locations until after the bats have been weaned. All exclusion activities would be completed under the supervision of a CDFG-approved bat biologist. During bridge demolition, the new bridge would be monitored to document use of the bat boxes. The Gerald Desmond Bridge would be monitored to determine if additional areas require exclusion. The exclusion devices would also be monitored to ensure that they are properly installed and not resulting in injury to the bats. Subsequent to demolition, the use of the new bridge would be monitored.

With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction or demolition effects associated with the North-side Alignment Alternative on bat species.

Double-crested Cormorants: Cormorants have been observed nesting on the SCE transmission towers on both sides of the Cerritos Channel, north of the LBGS, and they could be affected during construction of new transmission towers/ lines. The new towers would be constructed adjacent to the existing towers and potentially could result in abandonment of nests on the towers during construction activities; however, construction of the new towers would be initiated outside of the cormorant nesting season. Subsequent to construction of the new towers, the old towers would remain in place, and cormorants could nest on both the new and old towers.

Cormorant nesting may also be indirectly affected by visual and auditory disturbance associated with construction and demolition activities on the new and old bridge. However, the towers are approximately 1,837 ft (560 m) from the bridge; therefore, the potential for nest abandonment as a result of construction disturbances associated with bridge construction and demolition activities is low, and potential indirect effects on nesting double-crested cormorants would not be substantial. Construction of the proposed project would not affect cormorant feeding or roosting in the BSA because these birds are known to feed and roost in areas of the Inner Harbor subject to high human activity and disturbance (Table 2.3.5-2).

With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction or demolition effects on cormorants associated with the North-side Alignment Alternative.

Other sensitive Species: The California least tern and California brown pelican use the BSA rarely compared to other areas of the harbor, and they will likely avoid the construction zone during periods of high noise and high human activity; however, these species have been observed roosting and foraging in areas adjacent to construction areas and are apparently little disturbed by construction effects. Indirect effects of project construction on adjacent user areas are not anticipated to be substantial.

The only other special-status wildlife species expected to be present in the BSA during construction, albeit occasionally, are elegant tern, Caspian tern, and black skimmer. The BSA is not considered to be important foraging habitat for these species (see Table 2.3.5-2). With the exception of during pile driving activities, these species would likely continue to utilize the BSA during construction at similar levels as prior to and following construction.

Construction night lighting could result in indirect effects on special-status species, as well as on migratory birds and other birds using the BSA. Artificial lighting may disrupt resident bird behavior (International Dark-Sky Association, 2002; Longcore and Rich, 2004). Birds are known to occasionally become disoriented in bright lights and collide with power lines and towers, including coastal lighthouses (Martin, 1990). These collisions have been documented extensively (Trapp, 1998), but they do not include bird collisions with bridges. This could be due to a variety of factors, but generally, bird kills in these areas have factors (e.g., high-wattage lighting pointing upward, invisible power lines, or

tall towers that are difficult to detect) that would likely not be associated with the North-side Alignment Alternative. Given these considerations, including the extent and brilliance of ambient night time lighting of the harbor areas adjacent to the bridge, lighting on the existing bridge, and the industrialized nature of the BSA, the potential for bird collisions with the new bridge and related structures due to night lighting during construction would not represent a substantial effect on bird migration or bird use within the bridge vicinity; however, measures outlined in Section 2.3.5.4 include BMPs for bridge lighting during project construction.

South-side Alignment Alternative

Construction and demolition effects to sensitive species would be the same under the South-side Alignment Alternative as described under the North-side Alignment Alternative. With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction and demolition effects associated with the North-side Alignment Alternative.

Rehabilitation Alternative

Peregrine Falcon: During construction of the Rehabilitation Alternative, most of the project (approximately 40 months) would require major construction activities at night above the existing nest ledges during replacement of the bridge deck, and during the day directly on and adjacent to the ledges at the time of adjacent structure seismic upgrades and painting operations. To ensure no mortality of peregrines due to construction-related mishaps, CDFG-approved exclusion methods would be installed at existing nest sites under the supervision of a CDFG-approved raptor biologist before initiating rehabilitation activities and prior to or following the nest site selection and nesting seasons. During the final design phase, the Port, in coordination with CDFG, would select locations for alternate nesting ledge sites that would minimize the amount of activity within 250 ft (76 m) of new perch locations. The project would be phased to complete seismic retrofit activities at the selected locations first. Subsequent to completion of the seismic retrofit activities at the alternate nesting ledge locations, new nesting ledges would be created. If feasible, the work would be completed prior to the nest site selection period. If the work adjacent to the alternate nest locations could not be completed prior to the following nest site selection period, then it could result in loss of nesting ledges for a maximum of two breeding seasons (i.e., one during adjacent seismic work and one during adjacent painting work). As discussed under the North-side Alignment Alternative, the peregrine falcons do not always nest on the Gerald Desmond Bridge, and alternate nesting sites are believed to exist within the vicinity of the project for peregrines to utilize (e.g., hotels, silos, bridges, Long Beach City Hall) (Sipple, 2006). With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction effects associated with the Rehabilitation Alternative on falcons.

Bats: As previously discussed, construction of the Rehabilitation Alternative would require seismically upgrading the existing structure and would involve both day and night construction for most of the project (approximately 40 months). Night lighting would be focused onto the bridge surface to minimize lighting effects on night feeding. Construction would be staged to ensure that some roosting areas would be available at all times and/or would be completed first to minimize the potential effects on bats. If roost abandonment due to construction disturbance occurs, there are other suitable bridges and buildings within the Port area for the bats to utilize during rehabilitation activities.

All monitoring would be completed by a CDFG-approved bat biologist. Preconstruction surveys would be initiated approximately 1-year prior to construction. Surveys would focus on species identification and roosting areas. Surveys would include at least one breeding season. Information obtained during the surveys would provide necessary information for staged exclusion during construction. If preconstruction surveys identify that CDFG species of concern are utilizing the Gerald Desmond Bridge, then the Port would coordinate with CDFG regarding species observations and incorporate additional measures to minimize effects on the species, as applicable.

All exclusion activities would be completed under the supervision of a CDFG-approved bat biologist. The approved bat biologist would monitor all of the exclusion devices to ensure that they are properly installed and not resulting in injury to the bats. The monitor would also look for new areas that the bats might use and ensure exclusion from those areas, as applicable.

Subsequent to completion of the rehabilitation activities, all exclusion devices would be removed, and these areas on the bridge would again be made available for bat use.

With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse construction effects associated with the Rehabilitation Alternative on bats.

Double-crested Cormorants: The Rehabilitation Alternative does not include construction of replacement transmission towers/lines. Conceivably, nesting could be indirectly affected by visual, auditory and night lighting construction disturbance associated with bridge rehabilitation activities. However, the towers are approximately 1,837 ft (560 m) from the bridge; therefore, the potential for nest abandonment as a result of construction disturbances or potential indirect effects on nesting Double-crested Cormorants as a result of rehabilitation activities would be low. Construction of the Rehabilitation Alternative would not affect cormorant feeding or roosting in the BSA because these birds are known to feed and roost in areas of the Inner Harbor subject to high human activity and disturbance (Table 2.3.5-2).

Other sensitive Species: The California least tern and California brown pelican use the BSA rarely compared to other areas of the harbor, and they will likely avoid the construction zone during periods of high noise and high human activity; however, these species have been observed roosting and foraging in the project vicinity and are apparently little disturbed by construction effects. Indirect effects of project construction on nearby areas utilized by these species are not anticipated to be substantial.

The only other special-status wildlife species expected to be present in the BSA during construction, albeit occasionally, are elegant tern, Caspian tern, and black skimmer. Because the BSA does not represent important foraging habitat for these species (see Table 2.3.5-2), disturbances generated by construction activity would not substantially effect foraging. These species would likely continue to forage in the BSA during construction at similar levels as prior to and following construction.

Night lighting during bridge rehabilitation activities may result in indirect effects on special-status species, as well as on migratory birds and other birds using the BSA. Artificial lighting may disrupt resident bird behavior (International Dark-Sky Association, 2002; Longcore and Rich, 2004). Birds are known to occasionally become disoriented in bright lights and collide with power lines and towers, including coastal lighthouses (Martin, 1990). These collisions have been documented extensively (Trapp, 1998), but they do not include bird collisions with bridges. This could be due to a variety of factors, (e.g., high-wattage lighting pointing upward, invisible power lines, or tall towers that are difficult to detect) that would likely not be associated with the bridge Rehabilitation Alternative. Given these considerations, including the extent and brilliance of ambient nighttime lighting of the harbor areas adjacent to the bridge, lighting on the existing bridge, and the industrialized nature of the BSA, the potential for bird collisions with the bridge and related structures due to night lighting during construction would not represent a substantial effect on bird migration or bird use within the bridge vicinity; however, measures outlined in Section 2.3.5.4 include BMPs for bridge lighting during project construction.

Operational Impacts

North-side Alignment Alternative

Operation of this alternative would result in a permanent change to nighttime lighting on and adjacent to the new bridge. Lighting of the project during operation may affect special-status species and resident/migratory birds. Artificial lighting may potentially disrupt behavior, resulting in disorientation and collisions with the bridge structures (International Dark-Sky Association, 2002; Longcore and Rich, 2004); however, as previously discussed, it is not anticipated that disorientation or bird collision with the new structures would increase due to the new bridge lighting and would not represent a substantial effect on birds or special-status species migration or use within the vicinity of the bridge. The North-side Alignment Alternative would incorporate types of lighting known to minimize potential effects (i.e., low-pressure sodium lights, high-pressure sodium lights, or LED lights) and would avoid lighting types known to be disruptive to migrating wildlife (mercury vapor lamps [Jones, 2000]). Additionally, lighting would be shielded to ensure that light is focused inward, and the amount of lighting would be reduced where possible. During bridge lighting design, special attention would be given to those areas where nesting ledges or bat boxes are proposed. Lighting would be designed to focus away from these areas to minimize the effects on falcons and bats.

With implementation of the avoidance and minimization measures in Section 2.3.5.4, there would be no adverse operational effects associated with the Rehabilitation Alternative.

Use of the BSA and its vicinity by all special-status species is expected to continue similar to its current level. The special-status species of the BSA are adapted to traffic near roosting, nesting, and foraging areas; therefore, no substantial indirect effects on special-status species due to project operation are anticipated.

South-side Alignment Alternative

Operational effects to special-status species would be the same under the South-side Alignment Alternative as described under the North-side Alignment Alternative.

Rehabilitation Alternative

Operation of the Rehabilitation Alternative would not result in changes to bridge lighting, and bat and falcons could again occupy their familiar roosting and nesting areas after completion of construction. No operational effects to any species are anticipated under the Rehabilitation Alternative. Subsequent to completion of the bridge rehabilitation activities, operational impacts would be the same as the No Action Alternative.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

Temporary Measures

North- and South-side Alignment Alternatives

Peregrine Falcons

BR-2 ***Precluding Nesting on the Existing Bridge:*** Once the nest boxes are in place on the new bridge, and a minimum of 2 months prior to initiation of demolition activities within 500 ft (152 m) of the existing nesting locations, measures and/or structures approved by CDFG to discourage nesting at the previously used nest sites would be implemented under the supervision of a CDFG-approved raptor biologist. If existing nest sites are occupied, then exclusion activities could not occur until 30 days after the last young leaves the nest, or until nest abandonment, whichever occurs first (see No Work Zone under BR-3 Monitoring Program).

BR-3 ***Monitoring Program:*** The proposed monitoring program is based on measures from the Peregrine Falcon Monitoring and Mitigation Program (PFMMP) for the Gerald Desmond Bridge (BioResource Consultants, 1998) used from 1998 through 2004. Modified measures from the 1998 PFMMP, as proposed for the North- and South-side Alignment Alternatives, are provided below. A mitigation and monitoring plan will be prepared and submitted to CDFG for concurrence prior to initiation of construction activities.

- *Timing of Monitoring:* A raptor biologist will initiate monitoring at least 1-year prior to the beginning of construction and at least 2 months prior to nest site selection, generally January to mid-February. Monitoring will continue through the breeding season, which generally extends through mid-July. Monitoring will occur at the existing and new bridge and begin prior to the placement of artificial nest boxes on the new bridge and prior to attempts to preclude nesting at the existing bridge. Monitoring during construction will continue once weekly during the breeding season until the breeding season or construction is complete, whichever occurs first.

  Post-construction monitoring will occur for 3 years after construction. Surveys will be conducted once monthly from January through July to document peregrine falcon nesting at the new bridge.

- *Biological Monitor:* A raptor biologist with several years of experience observing peregrine falcon behavior and approved by the Port, Caltrans, and CDFG will be selected to conduct the monitoring.

- *Monitoring Effort:* All monitoring will be conducted with the use of binoculars and/or spotting scope and document peregrine falcon activity in the vicinity of the existing and new bridge. Monitoring during construction will require an average of 8 to 12 hours of observation per week to determine whether peregrine falcons are exhibiting normal breeding behavior and are nesting on the old bridge, or if they have relocated to an alternate nesting site.

  If peregrines attempt to nest on the existing bridge while construction activities are occurring, then a qualified peregrine monitor will observe the pair for a minimum of 16 hours per week to

determine the effect of the construction on peregrine behavior. This level of effort will continue as long as incubating peregrines or nestlings under the care of adults occupy the nesting site. If the young fledge, then the observations will continue for a minimum of 30 days after the last young leaves the nest ledge. If the raptor biologist reports that the peregrines are exhibiting behavior that may indicate potential nest abandonment, then visual screens or other methods, as approved by CDFG, would be implemented at the nesting locations. If nest abandonment occurs, then the Port, in coordination with CDFG, will determine the feasibility of creating temporary nesting ledges at alternate locations in areas with less intense construction activities.

Nesting on the new structures shall be discouraged until construction of the new bridge is completed. The Port, in coordination with CDFG, will develop measures to be implemented by a raptor biologist, where feasible, or under the direction of a raptor biologist, where precluded by construction site safety concerns, to discourage nesting. Such measures may include continued removal of nesting materials or installation of CDFG-approved exclusion devices.

- *No Work Zone:* During construction of the new bridge and prior to exclusion efforts for bridge demolition activities, the existing nest ledges and boxes would be available for nesting. If a nesting attempt is made on the new bridge while under construction, then a "No Work Zone" of approximately 250 ft (76 m) will be enforced until the raptor biologist implements CDFG-approved methods to discourage nesting on the areas under construction.

  Prior to exclusion activities on the existing bridge, nesting ledges on the new bridge will be available for use. During demolition, if falcons attempt to nest on the existing bridge, despite efforts to deter nesting, then a "No Work Zone" of approximately 250 ft (76 m) will be enforced until the raptor biologist implements CDFG-approved methods to further exclude nesting on the Gerald Desmond Bridge during demolition activities.

  Should a nest be successfully established within the construction area during construction of the new bridge or demolition of the Gerald Desmond Bridge, the Port will instruct construction crews to adhere to a "No Work Zone" around the nest site. The Port will coordinate with USFWS and CDFG to obtain permission to remove the nest in accordance with the MBTA. This "No Work Zone" will extend around the nest for a radius of approximately 250 ft (76 m) and be maintained until removal of the nest is authorized – 30 days after the last young leaves the nest or until nest abandonment, whichever occurs first. Demolition activities can continue at other locations outside of the "No Work Area."

- *Reporting:* Quarterly reports summarizing monitoring observations of nesting peregrines, including breeding behavior, nest data, disturbances, and reproductive success, will be submitted during construction of the new bridge. During demolition, post-construction monitoring reports will be prepared to provide details on placement of artificial nest boxes and exclusion activities and the use of nesting ledges on the new bridge. Reports will be prepared by the raptor biologist and submitted to the Port, Caltrans, and CDFG

Bats

BR-5 ***Precluding Roosting on the Existing Bridge:*** Prior to demolition, bats must be excluded from the existing bridge. Methods for excluding bats include use of a chemical repellant (i.e., naphthalene), use of floodlights, high-frequency noise, and placement of physical barriers such as nets to prevent bats from using roost sites (Greenhall, 1982). The exclusion method will be approved by the Port, Caltrans, and CDFG. The mechanical exclusion device is considered the safest and the most reliable (Exhibits 2.3.5-2 through 2.3.5-4). These barriers are commonly screens of mesh, hardware cloth, or wire, with mesh openings no greater than 0.25-in. (0.64-cm). The best

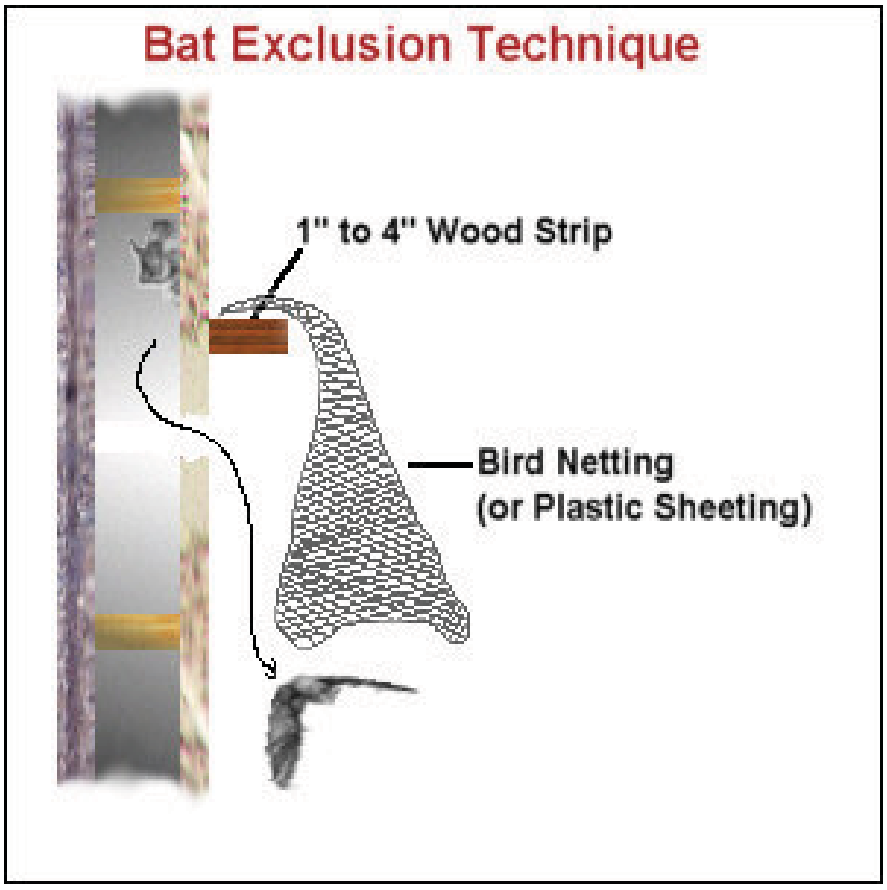

Exhibit 2.3.5-2
Mesh Exclusion for Small Openings[17]

[17] Exhibit by: http://www.batcon.org/discover/unguest.html.

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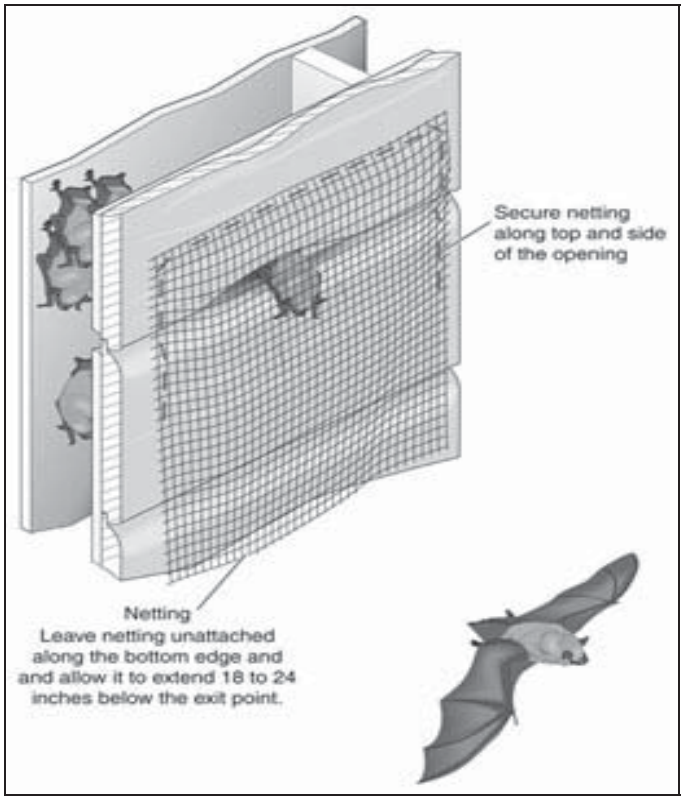

Exhibit 2.3.5-3
Mesh Bat Exclusion Method

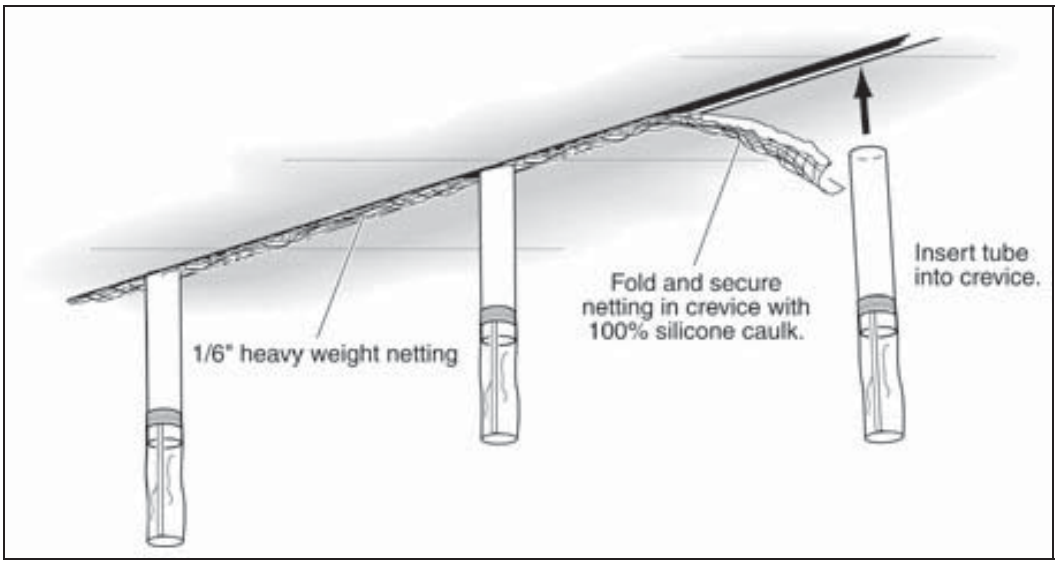

Exhibit 2.3.5-4
Collapsible One-Way Tubes[18]

[18] Exhibit by: http://batcon.org/discover/unguest.html

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time for bat proofing is November through March, after juvenile bats have learned to fly (Bat Conservation and Management, Inc., 2005). Exclusion work will be performed by contractors approved by Caltrans as experienced with excluding bats on bridges. This exclusion process may require 1 to 2 weeks, or potentially longer, given the size of the existing bridge.

Bat exclusion via netting is accomplished by first affixing mesh netting over known entry points using I-bolts, which allows bats to exit the bridge but not return. Bats returning to the bridge would first return to their normal point of entry, and then they would seek new roosts once they have determined that it is not possible to return to their old roosting site. This process will be monitored by a CDFG-approved bat biologist each night for at least 7 consecutive nights, or until no bats are observed to exit the structure from known roosting areas at nightfall. During this time, monitoring will be performed to ensure that bats do not discover and use new roosts on the existing bridge and to that no bats become entangled in netting. If any new roosts are discovered on the existing bridge, they will be covered with mesh according to the above procedure. Very small crevices or fissures in the bridge may be sealed using caulk or a similar filling agent. Should numerous bats still be observed exiting the bridge at night after installation of exclusion cloth, it may be necessary to add another exclusion method, such as floodlights illuminating access points or crevices used by attract bats (bats will not roost in a well-lit area).

BR-6 ***Bat Monitoring Program:*** A monitoring program will be implemented throughout the construction phases of the project, as applicable. CDFG concurrence on the proposed monitoring program will be obtained prior to initiation of bat monitoring/survey activities. All surveys/ monitoring will be conducted by an approved CDFG bat biologist. Preconstruction monitoring will focus on bat species identification, locations of bat roosts, and documentation of roost characteristics based on Fenton (2003) and O'Shea *et al.* (2003). If CDFG species of special concern are identified, then the Port will coordinate with CDFG and incorporate additional monitoring/ protection measures as applicable.

- *Timing of Monitoring:* Bat preconstruction surveys will be initiated a minimum of 1-year prior to the initiation of construction. The surveying and monitoring regime will consist of quarterly monitoring surveys, including a survey in June (i.e., prime bat roosting season). Each survey will include daytime and nighttime surveys (see Monitoring Effort) focused on identifying specific locations of bat roosts and roost access points.

  One month prior to the initiation of demolition of the existing bridge, the frequency of preconstruction surveys at the existing bridge and new bridge will increase to once weekly. This will coincide with placement of bat roosts on the new bridge. Quarterly construction monitoring will be completed. If CDFG sensitive bat species are identified during the preconstruction surveys or during quarterly surveys, then monthly monitoring during the bat breeding season will be completed and will focus on construction effects on bats. If it is determined that construction disturbance is affecting CDFG sensitive species, then the Port will coordinate with CDFG to incorporate additional protection measures, as applicable.

  Monitoring during the demolition phase will focus on ensuring that all bats have been excluded after installing the bat boxes on the new bridge and prior to initiating demolition activities. Subsequent to installation of exclusion devices, roosting areas will be monitored for 7 consecutive nights or until no bats are observed to exit the structure from known roosting areas at nightfall. During this time, monitoring will be performed to ensure that no bats become entangled in netting and that the bats do not discover and use new roost areas on the existing bridge. If any new roosts are discovered, then

exclusion netting will be installed and the monitoring process will continue until bats have been excluded from the bridge.

Post-construction monitoring will be conducted quarterly for 3 years and will document the use of new bat roosts.

- *Biological Monitor:* A qualified bat biologist thoroughly familiar with Anabat™ equipment and approved by CDFG, Caltrans, and the Port will conduct all bat monitoring and supervise the design and placement of new bat roosts and bat exclusion methods and devices.
- *Monitoring Effort:* The quarterly surveys will be performed during appropriate lunar/weather conditions and focus on identifying active bat roosts on the existing bridge. Each quarterly survey will include one survey during the day to search for urine staining and accumulation of bat feces or guano, and one evening/night survey period using a sonic bat (i.e., Anabat™ or Sonobat™). Several visits may be required per survey to determine specific roost locations and roost access points, and information necessary for designing bat exclusion devices on the existing bridge.

  During the quarterly preconstruction surveys, once the specific locations of bat roosts are determined, temperatures of existing roosting sites will be recorded so that selection of the location and type of artificial roosts on the new bridge can ensure duplication to the extent feasible of the thermal regime at existing bat roosts.

  Monitoring during construction and demolition will focus on whether construction activities are disturbing bats at the existing and new bridge. If disturbances to bats are documented, and monitoring has identified the presence of maternity roosts or CDFG sensitive species, then the Port will coordinate with CDFG to identify measures to minimize effects on the maternity roosts and sensitive species.
- *Reporting:* Quarterly reports summarizing the monitoring efforts and observations at the new and existing bridge will be prepared and submitted to the Port, Caltrans, and CDFG. Following construction, a final report will be prepared and include the name of the bat monitor, survey methods and dates, survey times and weather conditions, the type of artificial bat roosts used at the new bridge, and exclusion devices at the existing bridge. The final report will also include photos and detailed observations, and a conclusions and recommendations section for agency use in future projects.

Cormorants

BR-7 Initial construction activities for the new transmission towers/lines shall not begin during the nesting season (April through August) if double-crested cormorants have active nests on the transmission towers. Construction activities associated with the transmission tower/lines will be initiated prior to or after the breeding season or after the young have fledged.

Migratory Birds

BR-8 Construction and operational bridge lighting during and following construction will be designed to minimize the potential for bird collisions with the bridge structure. Lighting types known to minimize adverse effects (i.e., low-pressure sodium lights, high-pressure sodium lights, or light-emitting diode [LED] lights) will be used, and lighting types known to be disruptive to migrating wildlife, such as mercury vapor lamps (Jones, 2000), will be avoided. Additionally, lighting will be shielded to ensure that light is focused where it is needed, focusing lighting inward and minimizing the amount of lighting used to the maximum extent possible.

Rehabilitation Alternative

BR-1b ***Artificial Nest Boxes:*** Prior to the final design phase, the Port, in coordination with CDFG, will select temporary locations for alternate nesting sites on the Gerald Desmond Bridge that would minimize the amount of disturbance within 250 ft [76 m]) of new perch locations. Construction will be phased to complete adjacent seismic retrofit activities and

painting operations at the new nesting locations outside of the nest site selection and breeding periods. Subsequent to completing the adjacent seismic retrofit activities, the temporary nesting ledges will be installed and be continually available for use.

BR-2b ***Precluding Nesting on the Existing Bridge:*** To ensure no mortality of peregrines due to construction-related mishaps associated with bridge deck replacement, CDFG-approved exclusion methods will be installed at existing nest sites under the supervision of a CDFG-approved raptor biologist before initiating rehabilitation activities. Exclusion will occur prior to the nest site selection or after the breeding season. Due to the proximity of the bridge deck replacement activities to the existing nest sites, exclusion devices will remain until completion of the rehabilitation activities.

BR-3b ***Monitoring Program:*** The proposed monitoring program is based on measures from the PFMMP for the Gerald Desmond Bridge (BioResource Consultants, 1998) used from 1998 through 2004. Modified measures from the 1998 PFMMP, as proposed for the Rehabilitation Alternative, are provided below. A mitigation and monitoring plan will be prepared and submitted to CDFG for concurrence prior to initiation of rehabilitation activities.

- *Timing of Monitoring:* A raptor biologist will initiate monitoring at least 1-year prior to the beginning of rehabilitation and at least 2 months prior to nest site selection, generally January to mid-February. Monitoring will continue through the breeding season, which generally extends through mid-July. Monitoring will occur at the existing nesting locations and at the alternate nesting locations after placement of artificial nest boxes. Monitoring during construction will continue once weekly during the breeding season until the breeding season or construction is complete, whichever occurs first.

  Post-construction monitoring will occur for 3 years after construction. Surveys will be conducted once monthly from January through July to document peregrine falcon nesting at the existing sites.

- *Biological Monitor:* A raptor biologist with several years of experience observing peregrine falcon behavior and approved by the Port, Caltrans, and CDFG will be selected to conduct the monitoring.

- *Monitoring Effort:* All monitoring will be conducted with the use of binoculars and/or spotting scope and will document peregrine falcon activity in the vicinity of the bridge. Monitoring during bridge rehabilitation will require an average of 8 to 12 hours of observation per week to determine whether peregrine falcons are exhibiting normal breeding behavior and are nesting at the temporary locations, or if they have relocated to an alternate nesting site.

  If peregrines attempt to nest at the temporary nesting locations during rehabilitation activities, then a qualified peregrine monitor will observe the pair for a minimum of 16 hours per week to determine the effect of the construction on peregrine behavior. This level of effort will continue as long as incubating peregrines or nestlings under the care of adults occupy the nesting site. If the young fledge, then the observations will continue for a minimum of 30 days after the last young leaves the nest ledge. If the raptor biologist reports that the peregrines are exhibiting behavior that may indicate potential nest abandonment, then visual screens or other methods, as approved by CDFG, would be implemented at the nesting locations.

  Nesting on the Gerald Desmond Bridge in locations other than the temporary nesting locations shall be discouraged until rehabilitation activities are complete. The Port, in coordination with CDFG, will develop measures to be implemented by a raptor biologist, where feasible, or under the direction of a raptor biologist where precluded by construction site safety concerns to discourage nesting within areas under

construction. Such measures may include continued removal of nesting materials or installation of additional CDFG-approved exclusion devices.

- *No Work Zone:* During bridge rehabilitation activities, alternate nest ledges and boxes will be available for nesting. If a nesting attempt is made at a new location that would be under construction during the nesting season, a "No Work Zone" of approximately 250 ft (76 m) will be enforced until the raptor biologist implements CDFG-approved methods to discourage nesting at the new location.

  Should a nest be successfully established within the construction area during bridge rehabilitation, then the Port will instruct construction crews to adhere to a "No Work Zone" around the nest site. The Port will coordinate with USFWS and CDFG to obtain permission to remove the nest in accordance with the MBTA. This "No Work Zone" will extend around the nest for a radius of approximately 250 ft (76 m) and be maintained until removal of the nest is authorized or 30 days after the last young leaves the nest, or until nest abandonment, whichever occurs first. Rehabilitation activities can continue at other locations outside of the "No Work Area."

  Reporting: Quarterly reports summarizing monitoring observations of nesting peregrines, including breeding behavior, nest data, disturbances, and reproductive success, will be submitted during bridge rehabilitation activities. During post-construction monitoring, quarterly reports will provide details on nesting attempts and breeding behavior and reproductive success. Reports will be prepared by the raptor biologist and submitted to the Port, Caltrans, and CDFG.

Bats

BR-5b Precluding Roosting on the Existing Bridge: Prior to beginning construction activities on each section of the bridge, bats will need to be excluded from that section. Bat proofing will occur outside of the breeding season (October 30 through March 1) after juvenile bats have learned to fly. Bat exclusion will be staged to ensure that roosting sites in areas not currently under construction will be available at all times during the project to minimize the potential effects on bats. Exclusion methods for the Rehabilitation Alternative will be the same as discussed under BR-5.

BR-6b *Bat Monitoring Program:* A monitoring program will be implemented throughout the project, as applicable. CDFG concurrence on the proposed monitoring program will be obtained prior to initiation of bat monitoring/survey activities. All surveys/monitoring will be conducted by an approved CDFG bat biologist. Preconstruction monitoring will focus on bat species identification and locations of bat roosts and access points. If CDFG species of special concern are identified during preconstruction surveys, then the Port will coordinate with CDFG and incorporate additional monitoring and protection measures as applicable. During exclusion activities, monitoring of the exclusion devices will occur to ensure that entanglement of bats is not occurring. Monitoring will continue as long as bats are observed exiting the existing bridge. Subsequent to exclusion, monitoring during bridge rehabilitation activities will continue, focusing on locations where additional exclusion may be required. Post-construction monitoring will document recolonization of the bridge and former roost areas.

- *Timing of Monitoring:* Preconstruction surveys will be initiated a minimum of 1-year prior to the initiation of bridge rehabilitation activities. The surveying and monitoring regime will consist of quarterly monitoring surveys, including a survey in June (i.e., prime bat roosting season). One month prior to rehabilitation activities, surveys will increase to weekly and consist of daytime and nighttime surveys (see Monitoring Effort) focused on species identification, identifying specific locations of bat roosts, access points, and roost characteristics.

Monitoring during the bat exclusion phase will focus on ensuring that all bats have been excluded prior to initiating bridge rehabilitation activities. Subsequent to installation of exclusion devices, roosting areas will be monitored for seven consecutive nights or until no bats are observed to exit the structure from known roosting areas at nightfall. During this time, monitoring will be performed to ensure that no bats become entangled in netting and that the bats do not discover and use new roost areas on the existing bridge. If any new roosts are discovered, then exclusion netting will be installed and the monitoring process will continue until bats have been excluded from the bridge.

Post-construction monitoring will be conducted quarterly for 3 years to document the post-construction bat recolonization of the bridge.

- *Biological Monitor:* A qualified bat biologist, thoroughly familiar with Anabat™ equipment and approved by CDFG, Caltrans, and the Port, will conduct all bat monitoring and supervise the design and placement of bat exclusion methods and devices.

  Monitoring Effort: The quarterly surveys will be performed during appropriate lunar/weather conditions and focus on identifying active bat roosts on the existing bridge. Each quarterly survey will include one survey during the day to search for urine staining and accumulation of bat feces or guano, and one evening/night survey period using a sonic bat (i.e., Anabat™ or Sonobat™). Several visits may be required per survey to determine specific roost locations and roost access points, and information necessary for designing bat exclusion devices for the bridge. Monitoring during construction will focus on the presence of bats in the bridge area and to identify areas that would require further exclusion.

  Reporting: Quarterly reports summarizing the monitoring efforts and observations will be prepared and submitted to the Port, Caltrans, and CDFG. Following construction, a final report will be prepared and include the name of the bat monitor, survey methods and dates, survey times and weather conditions, and exclusion devices used. The final report will also include photos and detailed observations, and conclusions and recommendations for agency use in future projects.

Migratory Birds

BR-8b Bridge lighting during construction will be designed to minimize the potential for bird collisions with the bridge structure. Lighting will be shielded to ensure that light is focused inward on the construction area and minimize spillover that could affect migratory birds.

Permanent Measures

North- and South-side Alignment Alternatives

Peregrine Falcons

BR-1 ***Artificial Nest Boxes:*** A minimum of two nesting ledges with artificial nest boxes will be installed on the new bridge in different locations prior to demolition of the existing bridge. The boxes will be available prior to the nesting season. The new nest locations will be approved by CDFG and will be selected to minimize disturbance to the extent feasible. Should the peregrine falcons not use the new bridge for nesting despite the nest boxes, alternate suitable nesting sites are available in the project vicinity (e.g., hotels, silos, bridges, Long Beach City Hall).

Bats

BR-4 ***Placement of Bat Boxes:*** Bat roosting boxes on the new bridge will be made available a minimum of 2 months prior to demolition activities within 500 ft (152 m) of active roosts at the existing bridge. Bat roosting boxes will be designed and built during construction of the new bridge, which is scheduled to occur before demolition of the existing bridge, to be ready for placement once the under-bridge structures are complete. The location and design of artificial roosts will also consider the temperature measured at roosts on the existing bridge during the

preconstruction period. A variety of designs and recommendations are available (Langenstein *et al.,* 1998; Keeley and Tuttle, 1999).

In addition to, or in lieu of, bat roosting boxes, the new bridge may be designed to incorporate potential roosts as part of the structure (Exhibit 2.3.5-5), or such structures may be designed and added to the new bridge post-construction (Exhibit 2.3.5-6). Bats prefer roosting sites with crevices 0.5- to 1.25 in. (1.27 to 3.175 cm) wide (Keeley and Tuttle, 2000). Bats also use soffits if they are left open; therefore, bridge design could also include soffits that could be left open without damaging the bridge or hindering access for maintenance or other ongoing bridge work. One such type of artificial roost is the Texas bat-abode, which has an external panel on either side and 1- by 2-in. (2.5- by 5.1-cm) wooden spacers sandwiched between 0.5- to 0.75-in. (1.2- to 1.9-cm) plywood partitions (Exhibit 2.3.5-6). The internal partitions will be designed to provide crevices 0.75-in. (1.9 cm) wide and at least 12 in. (31 cm) deep. Smooth roost surfaces need to be textured to provide footholds for bats on one or both sides of each plywood partition, creating irregularities at least every 0.125-in. (0.3-cm). Footholds for bats are constructed of rough-sided paneling, or panels coated with polyurethane or epoxy paint sprinkled with rough grit, or attaching plastic mesh with silicone caulk or rust-resistant staples.

2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." FHWA guidance issued August 10, 1999, directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

2.3.6.2 Affected Environment

Invasive species in the BSA include two invasive algae (*Sargassum muticum,* and *Undaria pinnatifida*), the New Zealand bubble (mud) snail, the spotwrist hermit crab, and feral cat. Some of the weedy terrestrial plant species, such as fan palm, can also be invasive; however, given the lack of native terrestrial habitat in the BSA, the invasive nature of fan palms is not a concern.

2.3.6.3 Environmental Consequences

Evaluation Criteria

The following criterion is the basis for evaluating whether there are substantial adverse effects to plant species resulting from project development. Would the project:

- Result in the introduction or promote the establishment of any noxious weed or invasive plant or animal.

No Action Alternative

The No Action Alternative would not result in any construction activities or new operational effects, and it would not increase the likelihood of occurrence or spread of invasive species within the BSA.

Construction and Demolition Impacts

North- and South-side Alignment Alternatives

Construction activities could result in the disturbance and spread of invasive species to adjacent areas; however, in accordance with EO 13112 and subsequent guidance from FHWA, the potential to spread or introduce invasive terrestrial species during construction would be minimized with implementation of avoidance and minimization measures.

The POLB currently receives calls from ships originating around the world. When marine vessels call on a port, they can introduce invasive species during discharge of ballast water. Invasive marine species can degrade habitat quality through competition for habitat (e.g., on docks, pilings) or cause blooms of invasive non-native algae that can degrade habitat quality for many marine species. Additional Port calls may be required by ships transporting construction materials; however, it is unlikely that Port calls associated with transporting construction materials would originate from a port that has not previously made a call at the Port. Thus, the vessels shipping construction materials entering the Inner Harbor would be similar to the vessels that

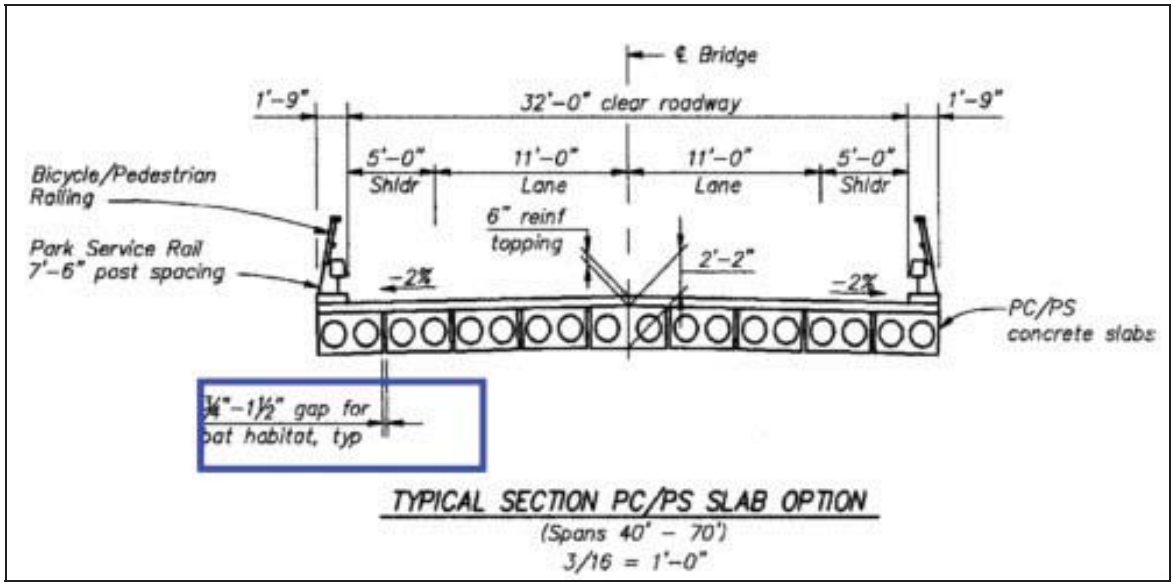

Exhibit 2.3.5-5
Bat-Friendly Bridge Specifications[19]

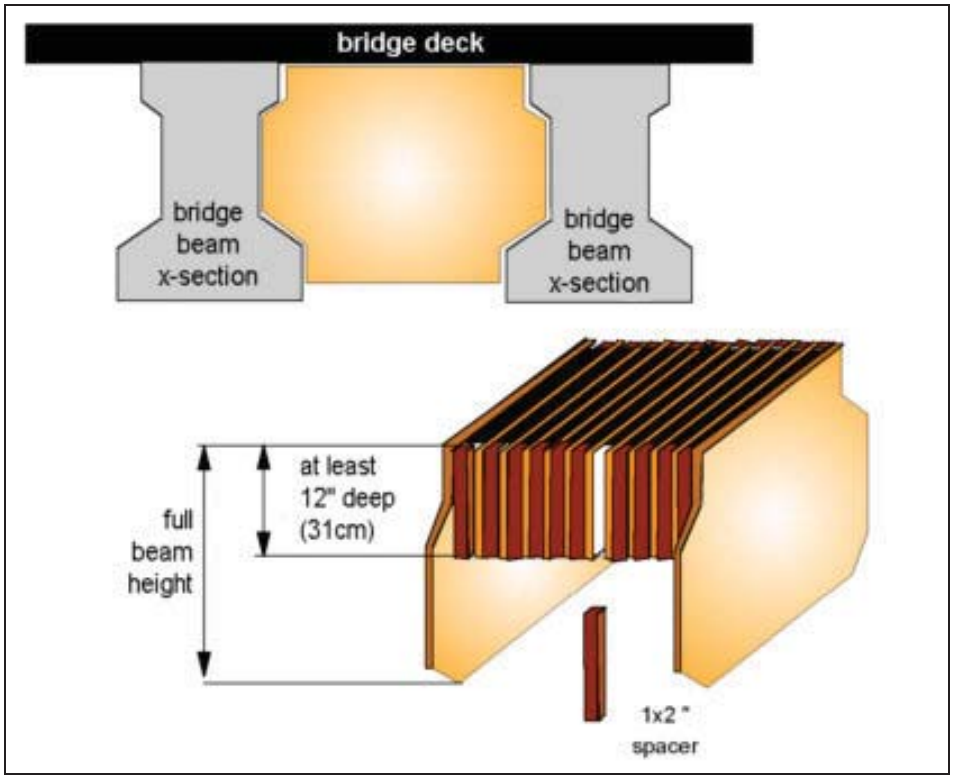

Exhibit 2.3.5-6
Postconstruction Bridge Retrofit[20]

[19] Exhibit by: http://batcon.org/discover/unguest.html
[20] Exhibit by: http://www.batcon.org/bridge/ambatsbridges/index.html.

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currently call on the Port and would not increase the potential for introduction or spread of existing or new invasive species into the Inner Harbor from ballast water discharge and would not require additional measures to minimize potential effects on marine resources.

Rehabilitation Alternative

As discussed under the North- and South-side Alignment Alternatives, implementation of avoidance and minimization measures would minimize the potential for the spread or introduction of invasive species during construction.

Operational Impacts

North-side Alignment Alternative

Landscape maintenance after construction could result in an increase in invasive species if project landscaping installed during project construction spreads into native habitats. Given the lack of native habitats in the BSA and with incorporation of the measures in Section 2.3.6.4, no adverse effects resulting from project operation to terrestrial plant or wildlife species are anticipated. Operation of the project would not result in a change in the type or number of vessels required to meet the operational requirements of the Port. Project operation would not increase the potential for spread or introduction of invasive marine species.

South-side Alignment Alternative

Operational effects on invasive species of the South-side Alignment Alternative would be the same as described under the North-side Alignment Alternative.

Rehabilitation Alternative

Construction required for the Rehabilitation Alternative would occur within the footprint of the Gerald Desmond Bridge and paved approaching roadways. Operational effects on invasive species associated with the Rehabilitation Alternative would be the same as described under the North-side Alignment Alternative.

2.3.6.4 Avoidance, Minimization, and/or Mitigation Measures

Temporary Measures

BR-9 Project landscaping will be limited to slopes near the bridge ramps and will follow the provisions set forth in EO 13112, which mandates preventing the introduction of and controlling the spread of invasive plant species on highway ROWs. No invasive species listed in the National Invasive Species Management Plan or the State of California Noxious Weed List shall be used in the landscaping plans for the proposed project, and all weedy vegetation removed during construction will be properly disposed of to prevent spread into areas outside of the construction area.

Permanent Measures

No measures are required.

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