# BIOLOGICAL RESOURCES TECHNICAL REPORT

8 JUNE 2018

## FIRE STATION 35
## PIER 22 ½ PROJECT
## San Francisco, California

Prepared for:
Baseline Environmental Consulting

and

San Francisco Public Works
San Francisco, California

13304-06.02550

Boudreau Associates
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ENVIRONMENTAL SCIENCE ■ PERMITTING ■ SEDIMENT AND WATER MANAGEMENT

8 June 2018
13304-06

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**Subject:** **Biological Resources Technical Report for Fire Station 35 Project, San Francisco, California**

Dear Bruce and Oliver:

Enclosed please find Boudreau Associates LLC Biological Resources Technical Report for the proposed Fire Station 35 project. The purpose of this technical report is to support Environmental Planning's CEQA analysis of the proposed project. Please contact us if you have any questions or comments.

Sincerely,

Christine Boudreau

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## Fire Station 35 Project

## 1. PROJECT UNDERSTANDING

The San Francisco Fire Department (SFFD) is proposing to construct the Fire Station 35 Project (project), a new fireboat facility near the existing Fire Station 35 located at Pier 22½ that would accommodate and centralize all the SFFD's maritime equipment and operations. The proposed project would construct a 16,000 square-foot (interior space) fireboat facility on a steel float (float) near the existing firehouse and adjacent to The Embarcadero. The project would also include demolition of the Pier 22½ shed and removal of approximately 3,500 square-foot north and 1,750 square-foot south pier decks and extraction of their supporting piles. Prior to placement and construction of the new fire station facility, the area would be dredged to ensure adequate water depth to freely float the barge throughout the tidal range.

Construction of the project would consist of demolition of the existing finger piers and the parking/storage area, and construction of a 173 feet long by 95 feet wide steel float upon which would be constructed the new 16,000 square-foot two-story fire station building. The float and fire station facility would be secured at the Pier 22 ½ location with up to six vertical steel pipe guide piles. A barge-mounted vibratory hammer would drive the piles to vibratory refusal and an impact hammer would then finish driving to the design tip elevation. The landside and waterside guide piles for the float would be driven to approximately 110 feet and 150 feet below mean sea level, respectively, and extend about twelve feet above the highest anticipated water elevation.

An access ramp would provide vehicular and pedestrian access to the float. The conceptual design includes a steel plate girder system spanning approximately 85 feet between the float and wharf, with an approximate deck width of 16 feet. The new float would provide mooring for three fire boats and a smaller vessel.

The existing Fire Station 35 and its supporting pier would remain. The proposed project would not involve any alterations to the existing historic Fire Station 35 building. Supporting infrastructure such as electrical systems and sewage would be installed and upgraded for the new fire station, and would require only minor excavation of soil landward of the seawall.

When in operation, the proposed project would provide water rescue and emergency-response services, including the training of staff. The functions of the new fire station building include emergency operations, equipment storage, supply and repair, ambulance dispatch, officers' suites and firefighter dormitory.

## 1.1 Purpose and Approach to Analysis

The purpose of this Biological Resources Technical Report (Technical Report) is to describe biological resources in the vicinity that could be affected by the proposed project, summarize the regulatory framework, and describe best practices that may be implemented to avoid or minimize effects on biological resources. It is our understanding that this Technical Report will be used to support environmental review of the project under the California Environmental Quality Act (CEQA). This assessment was prepared by Boudreau Associates LLC under contract to Baseline Environmental Consulting (Baseline) with review and approval by the San Francisco Planning Department's Environmental Planning (EP) Division.

# 2. ENVIRONMENTAL SETTING

The project site is located on the Embarcadero in the southern waterfront of the City and County of San Francisco at the north end of the San Francisco peninsula. The Peninsula faces the Pacific Ocean to the west and defines the western edge of the San Francisco Bay to the east. The Embarcadero roadway extends along the waterfront for a distance of approximately three and one-half miles. Vegetation along the Embarcadero is limited to street trees which consist of sycamores, palm trees, and a variety of other ornamental species. Street trees extend along nearly the entire length of The Embarcadero. This section describes the aquatic biological resources that have the potential to be within the vicinity of the proposed project.

Habitat quality and species distribution were considered in evaluating the likelihood of special-status species occurrence in the project area. The project site does not fall within any local, regional, or state habitat conservation plans.

The Biological Study Area encompasses approximately 1.6 acres and includes the proposed project structures and potential in-water work zones around these structures within the bay.

## 2.1 Marine Communities and Wildlife Habitats

### *2.1.1 Open Water (Pelagic) Habitat*

The open water (pelagic zone) environment of the Central Bay and within the project site is very similar to the open water coastal environment due to its proximity to the Pacific Ocean. Pelagic habitat is the predominant marine habitat in Central San Francisco Bay and includes the area between the water's surface and the seafloor. The physical conditions of the open water environment are constantly changing with tidal flow and season. As a result, they vary in temperature, salinity, dissolved oxygen, and turbidity within the water column depending on water depth, location, and season. The water column can be further subdivided into shallow-water/shoal and deepwater/channel areas. The proposed firehouse float location would occur adjacent to existing Port wharfs in shallower water. The Project location is not characterized as a shoal or mud flat. The pelagic water column habitat is predominantly inhabited by planktonic organisms that either float or swim in the water, fish, marine birds, and marine mammals.

### *2.1.2 Pelagic Fish Community*

Thirty-three (33) species of fish have been documented inhabiting Central Bay pelagic waters in recent years, of which three species account for 99 percent of the total abundance of fish regularly sampled in both the deep water and shallow areas of the Central Bay. Northern anchovy (*Engraulis. mordax*) is the overwhelming dominant species, accounting for up to 94 percent of those fish inhabiting the water column. Pacific herring (*Clupea pallasii*) and jacksmelt (*Atherinopsis californiensis*) are the second and third most common fish taxa in Central Bay waters, together accounting for an additional 5 percent of the fish sampled on an annual basis. The remaining 30 species collectively account for less than 1 percent of the fish species present annually. Important managed fish species or sensitive species of concern that are present in Central Bay pelagic waters include Northern anchovy (*E. mordax*), longfin smelt (*S. thaleichthys*), Chinook salmon (*Oncorhynchus tshawytscha*), Pacific sardine, (*Sardinops sagax*), and English sole (*Parophrys vetulus*).

### *2.1.3 Marine Mammals*

Few species of marine mammals are found within San Francisco Bay; only Pacific harbor seals (*Phoca vitulina richardsi*), California sea lions (*Zalophus californianus*), and harbor porpoises (*Phocoena phocoena*) are sighted year-round. Other marine mammal species that have occasionally been seen in San Francisco Bay include the gray whale (*Eschrichtius robustus*), individual humpback whales (*Megaptera novaeangliae*), the bottlenose dolphin (*Tursiops truncates*), the northern elephant seal (*Mirounga angustirostris*), the Guadalupe fur seal (*Arctocephalus townsendi*), and the northern fur seal (*Callorhinus ursinus*). Most cetacean sightings tend to occur in the Central Bay (the area bound by the Golden Gate Bridge, the San Francisco – Oakland Bay Bridge (SFOBB), and Richmond Bridge). The most common marine mammals sighted year-round in San Francisco Bay are Pacific harbor seals and California sea lions, which are the species most likely to occur in the project area.

In general, the presence of marine mammals in San Francisco Bay is related to distribution and presence of prey species and foraging habitat. Additionally, harbor seals and sea lions, the most likely marine mammal species to occur within the project area, use various intertidal substrates that are exposed at low to medium tide levels for resting and breeding. California sea lions are noted for using anthropogenic structures such as floating docks, piers, and buoys to haul out of the water to rest. Marine mammal haul-out locations do not occur in the project area.

## 2.2 Intertidal and Subtidal Habitats

### *2.2.1 Intertidal Habitats*

Intertidal habitats, or the regions of the Bay that lie between low and high tides, in the Central Bay include sandy beaches; natural and artificial rock (quarried riprap); concrete bulkheads; concrete, composite, and wood pier pilings; and mud flats. These intertidal habitats provide highly diverse and varied locations for marine flora and fauna. Proximity to the Golden Gate and Pacific Ocean has resulted in an intertidal zone inhabited by many coastal as well as estuarine species.

Central Bay intertidal invertebrate and algae communities contain many coastal hard substrate taxa interspersed with typical estuarine taxa.[1] Rip-rap that is used to support and protect shoreline provides additional habitat for diverse invertebrate communities than observed in natural hard substrate intertidal locations because of the increased and protected surface area created by the piled rocks. These artificial rock areas provide habitat for assorted marine species. Piles supporting maritime structures also provide both intertidal and subtidal habitat for marine biota.

### *2.2.2 Subtidal Habitat*

Central San Francisco Bay contains both soft sediment and hard substrate subtidal (submerged) habitat. Soft bottom substrate ranges between soft mud with high silt and clay content and areas of coarser sand. These latter tend to occur in locations subjected to high tidal or current flow such as at the project site. Soft mud locations are typically located in areas of reduced energy that enable deposition of sediments that have been suspended in the water column, such as in protected berth areas, under piers or deck structures, and behind breakwater structures.

Natural substrates include boulders, rock face outcrops, and low relief rock. Artificial hard substrate includes submerged concrete seawalls or breakwaters, bulkheads, vessel structures, piles, and riprap. Piles and riprap are found in every San Francisco Bay region and are a dominant feature along the Port's waterfront. These hard substrate areas provide habitat for marine algae, invertebrates and fishes, similar to the hard substrate in the intertidal zone of the Central Bay. The predominant seafloor habitat in the project area is expected to be unconsolidated soft sediment composed of combination of mud/silt/clay and sand. Exposure to wave and current action, temperature, salinity, and light penetration determine the composition and distribution of organisms within these soft sediments.[2]

The muddy-sand benthic community of the Central Bay consists of a diverse polychaete community. The harbor and main channel areas of the Central Bay are characterized as a mix of the benthic communities from surrounding areas of deep and shallow-water and slough marine communities. As a result of increased water flow and sedimentation in the harbor areas of the Central Bay, the majority of the species reported inhabiting seafloor sediments in this region of the Bay are deposit and filter feeders.

The most common large mobile benthic invertebrate organisms in the Central Bay include blackspotted shrimp (*Crangon nigromaculata*), the bay shrimp (*Crangon franciscorum*), Dungeness crab (*Metacarcinus magister*), and the slender rock crab (*Cancer gracilis*). All of

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1 San Francisco Planning Department. 2011. 34th America's Cup & J Herman Cruise Terminal and Northeast Wharf Plaza. Environmental Impact Report. San Francisco Planning Department Case No. 2010.0493E State Clearinghouse No. 2011022040

2 NOAA, *Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay*, prepared by NOAA National Marine Fisheries Service. Santa Rosa, CA, June 2007.

these mobile invertebrates are present throughout the Central Bay and provide an important food source for carnivorous fishes, marine mammals, and birds in San Francisco Bay's food web. Dungeness crabs use most of the Bay as an area for juvenile growth and development prior to returning to the ocean as sexually mature adults.[3]

*Demersal Fish*

Many different fish species spend all or part of their life cycle in association with the demersal (seafloor) zone. These species include flatfish, gobies, poachers, eelpouts, and sculpins, who all live in close association with the benthos during their sub-adult and adult life. Others, such as salmon, steelhead, longfin smelt, and other fish species, will use the benthos for foraging. As per reporting from CDFW, 12 species of fish dominate the community structure, constituting 98 percent of the species commonly inhabiting the seafloor and immediately adjacent waters in both the deep and shallow water regions of the Central Bay: Bay goby (*Lepidogobius lepidus*), English sole (*Parophrys vetulus*), speckled sanddab (*C. stigmaeus*), plainfin midshipmen (P. notatus), Pacific staghorn sculpin (*Leptocottus armatus*), shiner perch (C. aggregata), cheekspot goby (*llypnus gilberti*), Longfin smelt (*S. thaleichthys*), white croaker (*G. lineatus*), bonyhead sculpin (*Artedius notospilotus*), Pacific sandab (*Citharichthys sordidus*), and bay pipefish (*Syngnathus leptorhynchus*)[4]. The remaining 41 taxa account for less than 0.1 percent.

Anadromous species use the San Francisco Bay estuary on their way up rivers to spawn and as a rearing area for juveniles on their way down from their birthplace in the river to the open ocean. Native anadromous species include Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*O. mykiss gairdneri*) and both green and white sturgeon (*Acipenser medirostris* and *A. transmontanus*). Central San Francisco Bay is designated as essential fish habitat for Chinook salmon, Green sturgeon, steelhead, and assorted fish species included in the Coastal Pelagic, Pacific Groundfish, and Pacific Coast Salmon Fish Management Plans.

## 2.3 Potentially Jurisdictional Waters and Wetlands

No wetlands or other submerged aquatic vegetation occur in or near the project area. The shallow bay habitat within the project area is considered Waters of the U.S. and Waters of the State, subject to U.S. Army Corps of Engineers (USACE) and State Water Resources Control Board jurisdiction pursuant to the Clean Water Action (sections 404 and 401), Rivers and Harbor Act, and Porter-Cologne Act. The area also falls within the Bay Conservation and Development Commission (BCDC) bay and shoreline band jurisdiction.

## 2.4 Special-Status Species

The term "special-status" species includes those species that are listed and receive specific protection defined in federal or state endangered species legislation, as well as species not

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[3] Tasto, R. N., "San Francisco Bay: Critical to the Dungeness Crab?" In: T. J. Conomos, editor, San Francisco Bay: The Urbanized Estuary. Pacific Div Am Ass Adv Sci, San Francisco, California: 479-490, 1979.

[4] Interagency Ecological Program for the San Francisco Bay Estuary (IEP), *San Francisco Bay Study, 2005-2009*.

formally listed as “Threatened” or “Endangered” but designated as “Rare” or “Sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations, or local agencies such as counties, cities, and special districts. For the purposes of this analysis, special-status species include:

- Species that are listed or proposed or are candidate species for listing as Threatened or Endangered pursuant to the Federal Endangered Species Act (FESA) and managed by the US Fish and Wildlife Service (land and freshwater species) and National Marine Fisheries Service (marine species);

- Species listed as Rare, Threatened, or Endangered by the California Department of Fish and Wildlife (CDFW) pursuant to the California Endangered Species Act (CESA);

- Species managed and regulated under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act);

- Species protected under the Marine Mammal Protection Act;

- Species designated by CDFW as California Species of Concern; and

- Species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Section 15380).

### *2.4.1 Protected Federal and California Species*

The special-status species list presented in **Table 1** includes those for which potential habitat (i.e., general habitat types for breeding or foraging) occur within the general vicinity of the project site and can reasonably be expected to be affected by project activities. Species for which generally suitable habitat occurs but that were nonetheless determined to have low potential to occur in the project area are also listed. This table provides the rationale for each potential-to-occur determination.

**Table 1**
**Special-Status Fish and Marine Mammal Species That May Occur Within the Project Area**

| Common Name (*Scientific Name)* | Listing Status FESA/ MMPA | Listing Status CESA | General Habitat | Occurrence Within Project Area |
|---|---|---|---|---|
| Sacramento River winter-run Chinook salmon *(Oncorhynchus tshawytscha)* | FE/- | SE | Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay to freshwater spawning grounds | P |
| Central Valley spring-run Chinook salmon *(O. tshawytscha)* | FT/- | ST | Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay to freshwater spawning grounds | P |
| Central Valley steelhead trout *(O. Mykiss)* | FT/- | - | Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay to freshwater spawning grounds | P |
| Central California coast steelhead trout *(O. mykiss)* | FT/- | SSC | Ocean waters, Sacramento and San Joaquin Rivers; Migrates from Ocean through San Francisco Bay to freshwater spawning grounds | P |
| Green Sturgeon (*Acipenser medirostris)* | FT/- | SSC | Marine and estuarine environments and Sacramento River; All of San Francisco Bay | C |
| Longfin smelt (*Spirinchus thaleichthys)* | FC/- | ST | Throughout the nearshore coastal waters and open waters of San Francisco Bay including the river channels and sloughs of the Delta | C |
| Pacific harbor seal (*Phoca vitulina)* | -/FP | - | Coastal waters, and throughout Bay | C |
| California sea lion (*Zalophus californianus)* | -/FP | - | Coastal waters, and throughout Bay | C |
| Harbor porpoise (*Phocoena phocoena)* | -/FP | - | An inshore species inhabiting shallow, coastal waters and occasional large rivers, including San Francisco Bay | C |

Notes: FESA = Federal Endangered Species Act
CESA = California Endangered Species Act
MMPA = Marine Mammal Protection Act

FESA Listing Notes :
FE = Listed as Endangered by the federal government
FT = Listed as Threatened by the federal government
FC = Candidate to become a proposed species
FP = Federally Protected

CESA Listing Notes:
SE = Listed as Endangered by the State of California
ST = Listed as Threatened by the State of California
SSC = California Species of Special Concern

Occurrence within Project Area:
P = Potentially may occur
C = Confirmed year round

Species observed or with a moderate to high potential to occur in the project area are discussed in further detail below.

*Salmonids*

San Francisco Bay serves as a migratory pathway for two anadromous salmonid species: chinook salmon *(Oncorhynchus tshawytscha)* and steelhead (*O. mykiss*). "Chinook salmon and steelhead have highly variable life-history patterns, with age at spawning in Chinook varying from one year to seven years, and age at emigration to estuaries or the ocean ranging from a few days to two years. Steelhead have even more variable life histories and may omit ocean rearing altogether…"[5] Both species spawn in gravel-bed, freshwater streams. A biologically profound difference between the two species is that chinook die after spawning once (semelparous), whereas steelhead have the capacity to survive the spawning run, return to sea, and spawn again in future years (iteroparous); Hearn et al. and Jahn [6] provide recent data and discussions of out-migration of juveniles through San Francisco Bay. The following salmonid evolutionarily significant units (ESUs[7] have the potential to be present within the project site.

**Salmon, Sacramento winter-run: Status: State and Federal Endangered.**
Winter chinook, cut off from their native spawning grounds by Shasta Dam, now spawn as a single population in the main stem of the Sacramento River below the dam, where cool water released from the reservoir provides naturalistic habitat.[8] Spawning occurs in early summer, and juveniles spend 5-10 months in the upper river before migrating to the Delta, where they spend an "indeterminate time" before migrating to the ocean.[9] Summer temperatures in the Delta and Suisun Bay are not salubrious for salmon, and therefore the migration through San Francisco Bay likely occurs in late winter and spring. Winter-run Chinook salmon critical habitat includes all waters of San Francisco Bay north of the Bay Bridge.

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5 Williams, J. G. 2006. Central Valley Salmon: A Perspective on Chinook and Steelhead in the Central Valley of California. San Francisco Estuary and Watershed Science, 4(3).

6 Hearn, A. R., E. D. Chapman, A. P. Klimley, P. E. LaCivita, and W. N. Brostoff. 2010. Salmonid smolt outmigration and distribution in the San Francisco Estuary 2010. Interim Draft Report, University of California Davis and US Army Corp of Engineers. 90p;

Jahn, A. 2011. Young Salmonid Out-Migration through San Francisco Bay with Special Focus on their Presence at the San Francisco Waterfront. with Anchor QEA, L.P. for Port of San Francisco. May 2011.

7 National Oceanographic and Atmospheric Administration (NOAA). 2005a. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule. 9 Federal Register 70 (170): 52488-52585. September 2, 2005.

8 Moyle, P. B., 2002. Inland Fishes of California. University of California Press, Berkeley, California;

Lindley, S. T. et al. 2007. Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in The Sacramento-San Joaquin Basin.San Francisco Estuary and Watershed Science, 5(1).

9 Moyle, P. B., 2002. Inland Fishes of California. University of California Press, Berkeley, California.

**Chinook Salmon, Central Valley spring-run: Status: State and Federal; Threatened.**
Central Valley spring chinook currently exist as three independent naturally spawning populations in the upper Sacramento system plus a hatchery population on the Feather River (Lindley et al. 2007).[10] The Feather River part of this ESU is now believed to be closely related to fall-run fish.[11] "Spring Chinook have the most variable juvenile patterns [of the four named Central Valley chinook runs], based on monitoring of wild populations on Mill, Deer, and Butte creeks."[12] The Butte Creek population, at least, appear to be mainly fry migrants to low-gradient streams but some spring chinook have an ocean-type life history, in which fry migrate to the ocean soon after emergence.[13] Until on-going genetic work is complete, the timing of these fish entering San Francisco Bay will remain poorly known, although the migration probably occurs before summer temperatures arrive in the Delta and Suisun Bay. Critical habitat for the Central Valley spring-run Chinook salmon includes all waters of San Francisco Bay north of the Bay Bridge.

**Steelhead, Central California Coast: Status: Federally Threatened and State Species of Concern.**
The Central California Coast steelhead ESU extends from the Russian River in the north to Aptos Creek in the south and includes fish in tributaries to San Francisco and San Pablo Bays.[14] These fish migrate to freshwater in winter and spawn in winter and spring, then return to the ocean if they are in good health and not isolated by low water.[15] This ESU exists mainly as resident trout populations above dams, flood control projects, etc.[16] However, some steelhead runs do occur in streams tributary to San Francisco Bay. Koehler and Blank have documented outmigrations of several thousand juvenile steelhead from Napa River in recent years, with most leaving freshwater by June.[17] This ESU has the potential to occur in the Central Bay.

**Steelhead, California Central Valley: Status: Federally Threatened.**
All Central Valley steelhead are considered winter steelhead. Busby et al. (1996) wrote, "Steelhead within this ESU have the longest freshwater migration of any population of winter steelhead. There is essentially a single continuous run of steelhead in the upper

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[10] Lindley, S. T. et al. 2007. Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in The Sacramento-San Joaquin Basin.San Francisco Estuary and Watershed Science, 5(1).

[11] Williams, J. G. 2012. Juvenile Chinook Salmon (Oncorhynchus tshawytscha) in and Around the San Francisco Estuary. San Francisco Estuary and Watershed Science, 10(3).

[12] Ibid.

[13] Ibid.

[14] Moyle, P. B., 2002. Inland Fishes of California. University of California Press, Berkeley, California.

[15] Ibid.

[16] Ibid.

[17] Koehler, J. T., and P. D. Blank. 2013. Napa River steelhead and salmon monitoring report: 2012-2013 season. Napa County Resource Conservation District, Napa, California

Sacramento River. River entry ranges from July through May, with peaks in September and February; spawning begins in late December and can extend into April.[18] Critical habitat for Central Valley steelhead includes the waters of San Francisco Bay north of the Bay Bridge.

**Green Sturgeon (Acipenser medirostris): Status: Federally Threatened, California Species of Special Concern**

Green sturgeon is the most widely distributed member and the most marine-oriented of the sturgeon family, entering rivers only to spawn. Adults (age 15 years +) of the southern distinct population segment (DPS) of green sturgeon enter the Sacramento River in winter and spawn in spring and early summer; juveniles remain in fresh and estuarine waters for one to four years and then begin to migrate out to the sea.[19] Subadult green sturgeon present in San Francisco Bay in summer are probably a mix of Northern and Southern DPSs,[20] although most of them are of the southern DPS.[21]

Green sturgeon are thought to spawn every 3 to 5 years in deep pools with turbulent water velocities and prefer cobble substrates but can use substrates ranging from clean sand to bedrock. Within bays and estuaries, sufficient water flow is required to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds. Adult green sturgeon migrate into freshwater beginning in late February with spawning occurring in the Sacramento River in late spring and early summer (March through July), with peak activity in April and June. The upper Sacramento River has been identified as the only known spawning habitat for green sturgeon in the southern DPS.

Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods, and occasionally small fish, while juveniles have been reported to feed on opossum shrimp and amphipods. Subadult and adult green sturgeon occupy a diversity of depths within bays and estuaries for feeding and migration. Critical Habitat for the green sturgeon includes the Sacramento River, the Sacramento-San Joaquin Delta, and Suisun, San Pablo and San Francisco Bays. Green sturgeon have the potential to be present throughout the project area at any time of the year.

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[18] McEwan, D., and T.A. Jackson. 1996. Steelhead Restoration and Management Plan for California. California Department of Fish and Game, Inland Fisheries Division. Sacramento, California.

[19] Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern of California, Second Edition, University of California, Davis, Department of Wildlife and Fisheries Biology, prepared for the California Department of Fish and Game, Rancho Cordova, CA. June;

Israel, J. A., M. Blumberg, J. Cordes, and B. May. 2004. Geographic patterns of genetic differentiation among western U.S. collections of North American green sturgeon (Acipenser medirostris). North Amer. Journ. Fish. Man. 24:922-931.

[20] NOAA Fisheries. 2005b. Green Sturgeon (Acipenser medirostris) Status Review Update. Biological Review Team Santa Cruz Laboratory Southwest Fisheries Science Center NOAA Fisheries February 2005.

[21] Israel, J. A., K. J. Bando, E. C. Anderson, and B. May. 2009. Polyploid microsatellite data reveal stock complexity among estuarine North American green sturgeon (Acipenser medirostris). Can. J. Fish. Aquat. Sci. 66: 1491–1504.

**Longfin Smelt (Spirinchus thaleichthys) Status: State Threatened**
The longfin smelt is a small, slender-bodied pelagic fish listed as threatened under the California Endangered Species Act and is a candidate species for listing under the Federal Endangered Species Act. They typically measure approximately 3 inches in length as adults and generally live for two years, although some three-year smelt have been observed. Longfin smelt range from Monterey Bay northward to Hinchinbrook Island, Prince William Sound Alaska. In California, they have been commonly collected from San Francisco Bay, Eel River, Humboldt Bay and Klamath River. Longfin smelt reach a maximum size of about 150 mm. Longfin smelt comprise a small portion of the "whitebait" fishery in San Francisco Bay and have no sport fishery value.

Maturity is reached toward the end of their second year. As they mature in the fall, adults found throughout San Francisco Bay migrate to brackish or freshwater in Suisun Bay, Montezuma Slough, and the lower reaches of the Sacramento and San Joaquin Rivers. Spawning probably takes place in freshwater. Smelt have adhesive eggs which are deposited on sand, gravel, rocks, submerged aquatic vegetation, and other hard substrates during spawning. Spawning typically occurs during the late winter and early spring (mid- to late February) but varies among years in response to factors such as water temperatures, salinity and water flow. The combined effects of reduced freshwater flows, the invasive overbite clam (reduced levels of phytoplankton and zooplankton that are important to the Bay- Delta food web), and high ammonium concentrations act to significantly reduce habitat suitability for longfin smelt.[22]

In April and May, juveniles are believed to migrate downstream to San Pablo Bay; juvenile longfin smelt reside throughout the Bay (e.g., San Pablo and Central Bay) during the late spring, summer and fall and occasionally venture into the Gulf of the Farallons. Longfin smelt have a two-year lifecycle and reside as juveniles and pre-spawning adults in these more saline habitats during a majority of their life.

Juveniles tend to inhabit the middle and lower portions of the water column. Movement patterns based on catch data reported in the CDFW Bay Study indicates that longfin smelt actively avoid water temperatures greater than 22° C (72° F). These conditions occur within the Delta during the summer and early fall, when longfin smelt inhabit more marine waters further downstream in the bays and are not present within the Delta. They are primarily present in Central San Francisco Bay during the late summer months before migrating upstream in fall and winter. Longfin smelt have the potential to be present throughout the project area at any time of the year.

**Pacific Herring (Clupea pallasii)**
Pacific herring (Clupea pallasi) is neither a protected species under the FESA or CESA nor a managed fish species under the Magnuson-Stevens Act. Pacific herring does, however,

[22] 2012. Longfin Smelt 12-month Finding. http://www.fws.gov/sfbaydelta/species/longfin_smelt.cfm, posted October 2012.

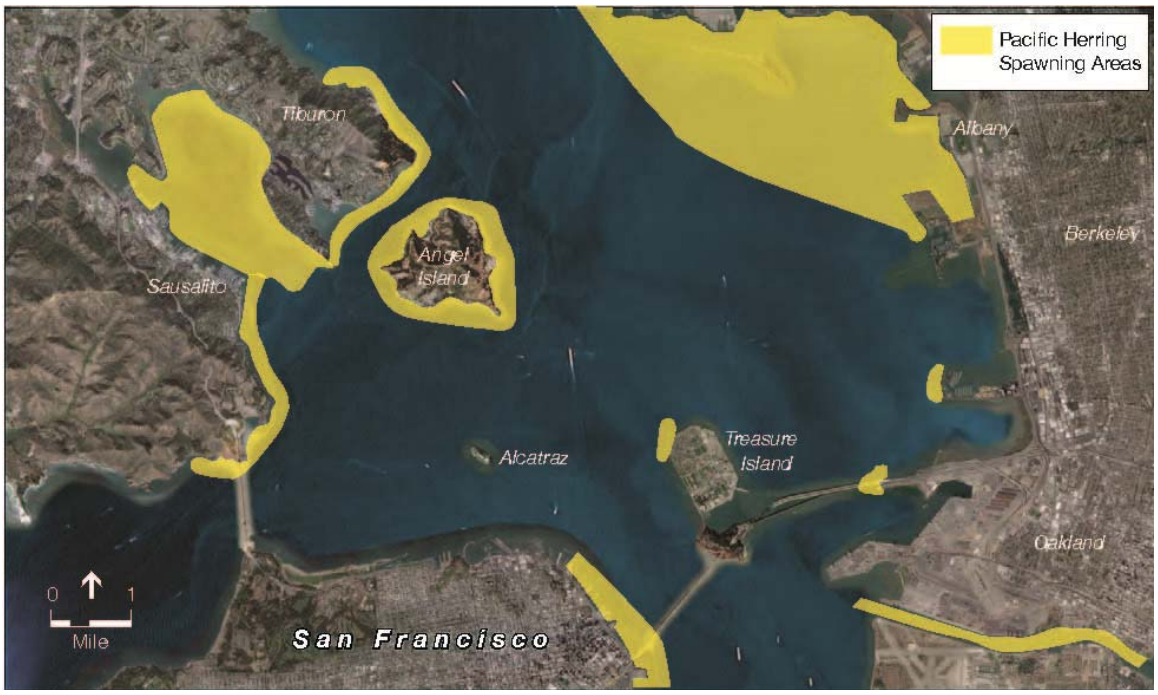
represent a species of special concern for San Francisco Bay since it is an important member of the San Francisco Bay marine ecosystem; provides an important food source for marine mammals, sea birds, and fish; and constitutes a state fishery that is within an urban estuary, making it particularly susceptible to anthropogenic impacts. As a state fishery it is regulated under Sections 8550-8559 of the California Fish and Game Code and as per guidance contained in the form of Fisheries Management Plans (FMP), for the sustainable management of California's historic fisheries. CDFW, in partnership with the fishing industry and conservation groups, is currently updating the Pacific herring FMP.

Pacific herring are found throughout the coastal zone from northern Baja California northward around the rim of the North Pacific Basin to Korea. In California, herring forage offshore during spring and summer and then migrate inshore to bays and estuaries to spawn October through April. The largest spawning aggregations in California occur in the San Francisco Bay and Tomales Bay. Most spawning areas are characterized as having reduced salinity with calm and protected waters. Spawning-substrate such as submerged aquatic vegetation beds, especially eelgrass beds, or rocky intertidal areas are preferred, but man-made structures such as pier piles, riprap, and other artificial shoreline structures are also frequently used as spawning substrates in San Francisco Bay. After hatching, herring fry and juveniles use nearby protected inshore waters for rearing habitat. Areas of identified as areas where Pacific herring have or may spawn are illustrated in Figure 1.

An individual can spawn only once during the season, and the spent female returns to the ocean immediately after spawning. Spawning usually takes place between October and March with a peak between December and February. After hatching, juvenile herring typically congregate in San Francisco Bay during the summer and move into deeper waters in the fall.

Pacific herring are known to occur and spawn along the San Francisco waterfront and within the project area.

**Figure 1**
**Pacific Herring Spawning Areas in Central San Francisco Bay**




SOURCE:
NOAA, San Francisco Bay Project Evaluation System Dredging Project interactive mapping database. http://mapping2.orr.noaa.gov/website/pies_piledriving/viewer.htm, accessed March 18, 2011; National Oceanic and Atmospheric Administration (NOAA), San Francisco Bay Project Evaluation System Dredging Project interactive mapping database, http://mapping2.orr.noaa.gov/website/pies_piledriving/viewer.htm, 2009

**Dungeness Crab (Cancer magister)**

Dungeness Crab is neither a protected species under the FESA or CESA nor a managed fish species under the Magnuson-Stevens Act. They are however, a valuable commercial and recreational species for the Bay Area. The San Francisco Bay estuary plays a key role in the growth and development of juvenile crabs.[23] Dungeness crabs reproduce in the ocean in winter; surviving juveniles then migrate nearer to shore the following spring. Most rearing of juvenile crabs within the region takes place in nearshore coastal waters, but estuaries such as Humboldt Bay and San Francisco Bay (see **Figure 2**) provide important nursery areas for the young. The San Francisco Bay estuary provides habitat for many life stages of the Dungeness crab. Juveniles are most abundant in San Pablo Bay with abundance decreasing further south. Adults seek out structurally complex habitats rather than exposed mud and sand to possibly deter predation. However, almost any substrate can

[23] California Department of Fish and Wildlife (CDFW), Annual Status of the Fisheries Report through 2011. https://www.wildlife.ca.gov/Conservation/Marine/Status#28027677-status-of-the-fisheries-report-through-2011

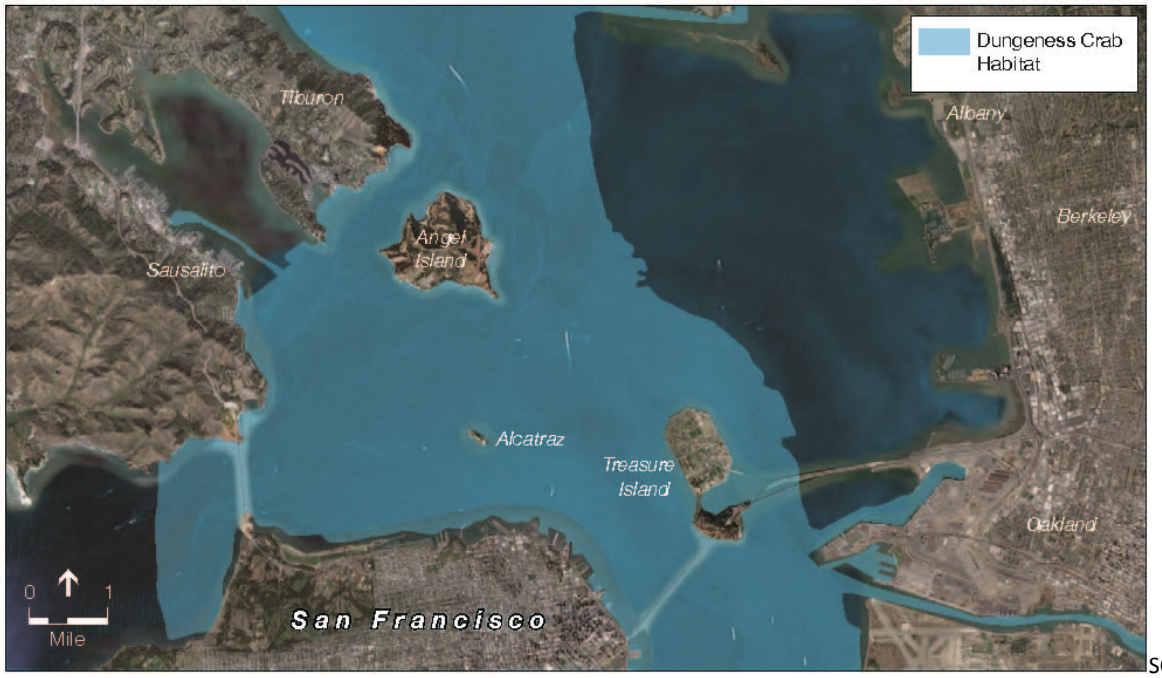
support this crab.[24] Crabs nurtured within the estuary are larger than cohorts who remained in the ocean; they also represent a larger percentage of harvested crabs inhabiting coastal waters off the shore of San Francisco.[25]

*Marine Birds*

The federal Migratory Bird Treaty Act (MBTA) and California Fish and Wildlife Code protect raptors, most native migratory birds, and breeding birds that would occur at the proposed project site and/or nest in the surrounding vicinity.

Common marine birds observed in the developed areas of the Central Bay include California brown pelican (*Pelecanus occidentalis*), western gull, surf scoter (*Melanitta perspicillata*), and wintering species such as western grebe (*Aechmophorus occidentalis*). Bird species of conservation concern that use portions of the San Francisco waterfront include double-crested cormorant and Caspian tern (*Sterna caspia*).

**Figure 2**
**Dungeness Crab Habitat within Central San Francisco Bay**




SOURCE: NOAA, San Francisco Bay Project Evaluation System Dredging Project interactive mapping database. http://mapping2.orr.noaa.gov/website/pies_piledriving/viewer.htm, accessed March 18, 2011.

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[24] Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California.

[25] Pauley, G. B., D. A. Armstrong, R. Van Citter, and G. L. Thomas, Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest) Dungeness crab, USFWS Biological Report 82(11.121), 1989.

*Marine Mammals*

As stated in Section 2.1.3, few species of marine mammals are found within San Francisco Bay; only Pacific harbor seals (*Phoca vitulina richardsi*), California sea lions (*Zalophus californianus*), and harbor porpoises (*Phocoena phocoena*) are sighted year-round. These species are the most likely to be present within the project area and are all federally protected species.

*Managed U.S. Fisheries Species*

Under the Magnuson-Stevens Act (see Section 5.14.5.1 for description), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), the National Marine Fisheries Service (NMFS), Fishery Management Councils, and federal agencies are required to cooperatively protect essential fish habitat for commercially important fish species such as Pacific coast groundfish, three species of salmon, and five species of coastal pelagic fish and squid. As defined by Congress, essential fish habitat includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Those fish species present in Central San Francisco Bay included in Fish Management Plans prepared by regional Fishery Management Councils under the Magnuson-Stevens Act are listed in **Table 2.**

**Table 2**
**Managed Fish Species in Central San Francisco Bay Under The Magnuson-Stevens Act**

| Fisheries Management Plan | Species, Common Name | Species, Scientific Name | Life Stage | Abundance |
|---|---|---|---|---|
| | Northern anchovy | *Engraulis mordax* | J, A | Abundant |
| | Jack mackerel | *Trachurus symmetricus* | E,L | Present |
| Coastal Pelagic | Pacific sardine | *Sardinops sagax* | J, A | Present |
| | English sole | *Parophrys vetulus* | J, A | Abundant |
| | Sand sole | *Psettichthys melanostictus* | L, J, A | Present |
| | Curlfin sole | *Pleuronichthys decurrens* | J | Rare |
| | Pacific sanddab | *Citharichthys sordidus* | E, L, J, A | Present |
| | Starry flounder | *Platichthys stellatus* | J, A | Present |
| | Lingcod | *Ophiodon elongatus* | J, A | Present |
| | Brown rockfish | *Sebastes auriculatus* | J | Present |
| | Pacific whiting (hake) | *Merluccius productus* | E,L | Present |
| | Kelp greenling | *Hexagrammos decagrammus* | J, A | Present |
| | Leopard shark | *Triakis semifasciata* | J, A | Present |
| | Spiny dogfish | *Squalus acanthias* | J, A | Present |
| | Skates | *Raja* ssp. | J, A | Present |
| | Soupfin shark | *Galeorhinus galeus* | J, A | Rare |
| | Bocaccio | *Sebastes paucispinis* | J | Rare |
| Pacific Groundfish | Cabezon | *Scorpaenichthys marmoratus* | J | Present |
| | Chinook salmon | *Oncorhynchus tshawytscha* | J, A | Seasonally Present |
| Pacific Coast Salmon | Coho salmon | *Oncorhynchus kisutch* | J, A | Historically Present, Current Occurrence unknown |

NOTES: A = Adult J = Juvenile L = Larvae E = Egg

SOURCE: National Marine Fisheries Service (now known as NOAA Fisheries) Southwest Region (NMFS SWR). 2001. Fisheries Management Plan Species Distributions in San Francisco, San Pablo and Suisun Bays. Accessed April 10, 2011. http://swr.nmfs.noaa.gov/hcd/loclist.htm and Interagency Ecological Program for the San Francisco Bay Estuary (IEP), *San Francisco Bay Study, 2005-2009,* unpublished raw midwater trawl data, 2005-2009; Interagency Ecological Program for the San Francisco Bay Estuary (IEP), *San Francisco Bay Study, 2005-2009,* unpublished raw bottom trawl data, 2005-2009

*Sensitive Natural Communities*

Within San Francisco Bay, there are many marine communities and habitats that can be considered particularly sensitive to disturbance or possess unique or special ecological value.[26] Additionally, certain waters of the U.S. are considered "special aquatic sites" because they are generally recognized as having unique ecological value. Such sites include sanctuaries and refuges, mudflats, wetlands, vegetated shallows, eelgrass beds, and coral reefs. Special aquatic sites are defined by the United States Environmental Protection Agency (U.S. EPA) and may be afforded additional consideration in the permit process for a project requiring federal agency approvals or covered under federal regulations. Within Central San Francisco Bay, two sensitive natural communities that are routinely afforded special attention are submerged aquatic vegetation beds, such as eelgrass beds, and native oyster beds.

**Eelgrass (Zostera marina)**

Eelgrass (*Zostera marina*) is a native marine vascular plant indigenous to the soft-bottom bays and estuaries of the Northern Hemisphere. It has been afforded special management considerations by CDFW, USFWS, NMFS, U.S. EPA, BCDC, and the Golden Gate Audubon Society. Eelgrass beds perform multiple functions within an estuarine ecosystem. They are considered a "habitat-forming" species that creates unique biological environments for spawning Pacific herring[27] and serve as nursery grounds for many important Bay fish including pacific herring, halibut, and English sole. They provide substrate for epibenthic algae, invertebrates, and crustaceans and important rearing habitat for invertebrate species such as shrimp (*Palaemonetus paludosus*) and Dungeness crabs (*Cancer magister*). Eelgrass beds also provide important foraging areas for waterfowl such as black brandt (*Branta bernicla nigricans*)[28] and American wigeon (*Anas americana*).

In addition to providing refugia for young fish, eelgrass beds stabilize shorelines by dampening wave energy, collecting sediments transported to the shore, and preventing shore erosion. They also improve water quality by collecting and filtering organic matter and sediments. There are no eelgrass beds reported within the project area.[29]

**Native Olympia Oysters (Ostrea lurida)**

The Olympia oyster (*Ostrea lurida*), also known as the "native oyster," is native to most of western North America and, prior to overharvesting and increased siltation from hydraulic mining in the mid-19th century, was a component of the San Francisco Bay marine

[26] San Francisco Bay Subtidal Habitat Goals Project, San Francisco Bay Subtidal Habitat Goals Report – Conservation Planning for the Submerged Areas of the Bay; 50-Year Conservation Plan, available at http://www.sfbaysubtidal.org/report.html, 2010.

[27] NOAA*, Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay*, prepared by NOAA National Marine Fisheries Service. Santa Rosa, CA, June 2007.

[28] Merkel, K.W. and Associates. 2005. Baywide eelgrass (Zostera marina L.) inventory in San Francisco Bay: Eelgrass bed characteristics and predictive eelgrass model. Report prepared for the State of California Department of Transportation in cooperation with NOAA Fisheries.

[29] California Department of Fish and Wildlife GIS database accessed at: https://map.dfg.ca.gov/bios/?al=ds1503

ecosystem.[30] Olympia oysters inhabit brackish water conditions but prefer salinities above 22 parts per thousand. In their natural state, Olympia oysters form sparse to dense beds in coastal bays and estuaries and in drought conditions will move up into channels and sloughs, dying off when wetter conditions return. Olympia oysters are not reef builders like their East and Gulf Coast cousin, *Crassostrea virginica*. Olympia oysters are known to provide high biodiversity habitat because they provide physical habitat structure sought by juvenile fish and crustaceans, worms, and foraging fish and birds.[31] They also stabilize sediment, reduce suspended sediment, and improve light penetrations, thereby improving the physical conditions that encourage the establishment of submerged aquatic vegetations, such as eelgrass beds (*Zostera marina*).

Naturally occurring populations of native oysters can be found throughout San Francisco Bay on natural and artificial hard substrate from Carquinez Strait to the South Bay. Oysters have appeared to do well subtidally in many man-made habitats such as on marina floats and in tidally restricted ponds, lagoons, and saline lakes. Although thought to be extinct from the Bay since the mid-19$^{th}$ century, native oysters have been observed in various locations in San Francisco Bay since 2000.[32] Their presence in other rocky intertidal, rocky subtidal, and man-made habitats in Central San Francisco Bay, including Alcatraz and Angel Islands, is expected. Based on the experience and observations of Port workers and personnel, native oysters have been reported inhabiting the intertidal and subtidal rocks composing the riprap shoreline and on wharf pilings of the Port of San Francisco.

# 3. REGULATORY FRAMEWORK

## 3.1 Federal Regulations

### *3.1.1 Federal Endangered Species Act*

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 United States Code [USC] 1533(c)). A detailed discussion of the FESA can be found in Section 5.14.2.1. Multiple species of fish and marine mammals are listed by the USFWS under FESA, as discussed in Section 5.14.4.4.

### *3.1.2 Federal Regulation of Wetlands and Other Waters*

The United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (U.S. EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Sections 404 and 401 of the Clean Water Act.

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[30] NOAA. Habitat Connections, Restoring the Olympia Oyster (*Ostrea conchaphila = lurida*), Volume 5, Number 2, 2004, available at http://www.oyster-restoration.org/reports/OlympiaOysterHabitatConnections.pdf, 2008, accessed March 22, 2011.

[31] Ibid.

[32] Ibid.

Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the USACE. Some classes of fill activities may be authorized under General or Nationwide Permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the Federal Endangered Species Act. In addition to conditions outlined under each Nationwide Permit, project-specific conditions can be required by the USACE as part of the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued.

Section 401 of the Clean Water Act requires that applicants who obtain a USACE permit also obtain state certification that the activity associated with the permit will comply with applicable state effluent limitations and water quality standards. In California, water quality certification, or a waiver, must be obtained from the Regional Water Quality Control Board, for both Individual and Nationwide Permits.

The USACE also regulates activities in navigable waters under Section 10 of the Rivers and Harbors Act. The construction of structures, such as tidegates, bridges, or piers, or work that could interfere with navigation, including dredging or stream channelization, may require a Section 10 permit, in addition to a Section 404 permit if the activity involves the discharge of fill.

Finally, the federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

### *3.1.3 Magnuson-Stevens Fishery Conservation and Management Act*

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. Sections 1801–1884) of 1976 as amended in 1996 and reauthorized in 2007 applies to fisheries resources and fishing activities in federal waters that extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

The Magnuson-Stevens Act defines "essential fish habitat" as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The Magnuson-Stevens Act, as amended through 2007, sets forth a number of new mandates for National Oceanic and Atmospheric Administration (NOAA) Fisheries, regional fishery management councils, and federal action agencies to identify essential fish habitat and to protect important marine and anadromous fish habitat. The Magnuson-Stevens Act provided NOAA Marine Fisheries with legislative authority to regulate fisheries in the U.S. in the area between 3 miles and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters. The councils, with assistance from NOAA Marine Fisheries, are required to develop and implement Fishery Management Plans, which include the delineation essential fish habitat, for all managed

species. A Fish Management Plan is a plan to achieve specified management goals for a fishery and is composed of data, analyses, and management measures for a fishery. Essential fish habitat that is identified in a Fish Management Plan applies to all fish species managed by that Fish Management Plan, regardless of whether the species is a protected species or not. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b), in conjunction with required Section 7 consultation under FESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations.

The Central Bay region of the San Francisco Bay, where the project site is located, is designated as essential fish habitat for fish managed under three Fish Management Plans and as a Habitat Area of Particular Concern under two Fish Management Plans. A total of 20 species of commercially important fish and sharks managed in the Pacific groundfish and coastal pelagics Fish Management Plans use this region of the Bay as either essential fish habitat or habitat area of particular concern. In addition, the Pacific coast salmon Fish Management Plan, which includes Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*), identifies all of the San Francisco Bay as essential fish habitat.[33]

### *3.1.4 Rivers and Harbors Appropriations Act of 1899*

Section 10 of the Federal Rivers and Harbors Appropriations Act of 1899 (RHA) (30 Stat. 1151, codified at 33 U.S.C. Sections 401, 403) prohibits the unauthorized obstruction or alteration of any navigable water (33 U.S.C. Section 403). Navigable waters under the RHA are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 C.F.R. Section 3294). Typical activities requiring Section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

### *3.1.5 Marine Mammal Protection Act*

The Marine Mammal Protection Act of 1972, as amended in 1981, 1982, 1984, and 1995, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the "taking" of any marine mammal. The Marine Mammal Protection Act defines "taking" as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such. The act also imposes a moratorium on the import, export, or sale of any marine mammals, parts or products within the United States. These prohibitions apply to any person in U.S. waters and to any U.S. citizen in international waters.

The primary authority for implementing the act belongs to the USFWS and NOAA Marine Fisheries. The USFWS is responsible for ensuring the protection of sea otters and marine otters,

[33] National Marine Fisheries Service (now known as NOAA Fisheries) Southwest Region (NMFS SWR). 2001. Fisheries Management Plan Species Distributions in San Francisco, San Pablo and Suisun Bays. Accessed April 10, 2011. http://swr.nmfs.noaa.gov/hcd/loclist.htm

walruses, polar bears, three species of manatees, and dugongs. NOAA is responsible for protecting pinnipeds (seals and sea lions) and cetaceans (whales and dolphins).

The Marine Mammal Protection Act, as amended, provides for the "incidental take" of marine mammals during marine activities, as long as NOAA Marine Fisheries finds the "taking" would be of small numbers of individuals and have no more than a negligible impact on those marine mammal species not listed (i.e., listed under the Federal Endangered Species Act (FESA), as depleted under the Marine Mammal Protection Act, and not having an unmitigable adverse impact on subsistence harvests of these species.

### *3.1.6 Migratory Bird Treaty Act*

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act applies to whole birds, parts of birds, and bird nests and eggs. Marine birds that are covered by provisions of the Migratory Bird Treaty Act and could be expected to be present in the project area include the brown pelican (*Pelicanus Occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), and the western gull (*Larus occidentalis).*

### *3.1.7 National Invasive Species Act*

Under the National Invasive Species Act of 1996, the United States Coast Guard (USCG) established national voluntary ballast water guidelines. The USCG published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the USCG's responsibility, under the National Invasive Species Act, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans.

### *3.1.8 Estuary Protection Act (16 USC 1221–1226)*

The Estuary Protection Act highlights the value of estuaries and the need for conservation of their valuable natural resources. It authorizes the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory estuaries of the United States and to determine whether any areas should be acquired by the federal government for future protection.

Under this act, the Secretary of the Interior is required to review all project plans and reports for land and water resource development affecting estuaries and make an assessment of likely impacts and related recommendations for conservation, protection, and enhancement of estuaries.

### *3.1.9 Coastal Zone Management Act*

The Coastal Zone Management Act (CZMA) of 1972, as amended, set forth the federal policy that state coastal management programs should provide for public access to the coasts for

recreational purposes. While boating and associated activities, such as marinas, are an important means of public access, they may also pose a threat to the health of aquatic systems if poorly planned or managed. In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA) to address nonpoint source pollution problems in coastal waters. Section 6217 of CZARA and Section 319 of the CWA require California and 28 other states to develop coastal nonpoint source pollution control programs, incorporating required management measures to reduce or prevent polluted runoff to coastal waters from specific sources. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state except within the San Francisco Bay where BCDC has authority for implementation of the CZMA within its jurisdictional area.

### *3.1.10 Long Term Management Strategy Management Plan for Dredging in San Francisco Bay*

The Long Term Management Strategy (LTMS) Management Plan for maintenance dredging of navigation channels in San Francisco Bay, as established in 2001, provides for a cooperative approach to sediment management in the San Francisco Bay area. It represents a cooperative program among the U.S. EPA, USACE, San Francisco Regional Water Quality Control Board (RWQCB), BCDC, and regional stakeholders, including NOAA NMFS, CDFW, area environmental organizations, and water-related industries. The LTMS facilitates the economical and environmentally responsible maintenance of critical and needed navigation channels in the Bay and the environmentally responsible disposal of dredged material. It maximizes the use of dredged material as a beneficial resource, and establishes a cooperative permitting framework for dredging, dredged material disposal, and development of beneficial reuse site for dredge material. A key component of the LTMS is the establishment of construction work windows that include time periods when construction activities that have the potential to affect aquatic and terrestrial wildlife habitat and migration activity are allowed, restricted, or prohibited. Different restrictions and requirements are enforced depending on the affected species and time of year. If a project proponent wishes to construct during restricted periods, they must formally submit for consultation with the appropriate resource agencies (NOAA, USFWS, and CDFW). Through formal consultation specific measures would be implemented to avoid or reduce potential impacts.

**Table 3** presents dredging work windows and restrictions for construction along the San Francisco waterfront.

**Table 3**
**Environmental Work Windows for Maintenance Dredging Activities As Per Long Term Management Strategy For San Francisco Bay**

| Species | Applicable Bay Region/Location | Authorized Work Windows |
|---|---|---|
| Steelhead Trout | Central San Francisco Bay, Bay Bridge to Sherman Island | June 1 to November 30 |
| Chinook Salmon, juveniles | Bay Bridge to Sherman Island | June 1 to November 30 |
| Coho Salmon | Waters of Marin County from the Golden Gate Bridge to Richmond-San Rafael Bridge | June 1 to October 31 |
| Pacific Herring | Central San Francisco Bay, Richardson Bay, North and South Bay | March 1 to November 30 |
| Dungeness Crab | North Bay, San Pablo Bay, and shallow berthing areas | July 1 to May 30 |

SOURCE: LTMS Environmental Work Windows, Informal Consultation Preparation Packet, prepared by the LTMS Environmental Windows Work Group, April 2004.

### *3.1.11 Regulation of Pile Driving Activities in San Francisco Bay*

The NOAA Marine Fisheries 2013 programmatic consultation for Section 7 of the endangered species act for listed species established activity-specific criteria to avoid or minimize adverse effects to individuals and cumulative instances of specific routine permitted activities.[34] These activities include bridge repair, bank stabilization, culvert replacement, navigational dredging, boat dock construction and maintenance, piling installation, pipeline repairs, and levee maintenance. As part of this project consultation with NOAA Marine Fisheries, pursuant to FESA, the Marine Mammal Protection Act, and the Magnuson-Stevens Act, if the proposed activity included one of the above routine permitted activities and conformed to normal and routine type operations, the activity would be allowed pursuant to specific requirements.

Specific to piling installation, this programmatic consultation establishes that, for any size of steel, wood, or concrete piling installation employing a vibratory hammer only, installation can occur year-round. Impact hammers have the following restrictions: wood piles may be installed year-round, concrete piles less than 18 inches in diameter may be installed year-round, and steel piles less than 12 inches in diameter and using impact hammers less than 3,000 pounds and employing a wood cushion bloc may occur year-round.

Pile driving activities outside these general criteria would be subject to additional measures to ensure the reduction of pile driving noise and the potential for deleterious effects to fish and

[34] NMFS, Programmatic Consultation Letter to Brigadier General John R. McMahon, U.S. Army Corps of Engineers, from Steven E. Edmondson, NMFS, dated July 17, 2013.

marine mammals. Use of standard BMPs would further reduce potential effects when marine mammals are present, work windows for pile installation are species-specific and may require onsite monitors and Incidental Harassment Permits. Typical BMPs that NMFS has required include:

- Maintain underwater sound pressure (root mean square) below levels that can injure (180 dB re 1 micropascal) or affect the behavior (160 dB re 1 micropascal) of marine mammals
- Maintain a 500-meter safety zone around sound sources in the event the sound level is unknown or cannot be adequately predicted
- Maintain sound levels below 90 dBA in air when pinnipeds (seals and sea lions) are present
- Halt work activities when a marine mammal enters the 500-meter safety zone
- Bring loud mechanical equipment online slowly
- Adjust vessel speed when marine mammals are in the project area

## 3.2 State Regulations

### *3.2.1 California Endangered Species Act*

Under the California Endangered Species Act (CESA), California Department of Fish and Wildlife (CDFW) maintains a list of threatened species and endangered species (California Fish and Game Code Section 2070). CDFW also maintains a list of "candidate species," which are species that CDFW has formally recognized as being under review for addition to either the list of endangered species or the list of threatened species. CDFW also maintains lists of "Species of Special Concern." Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed project that may affect a candidate species. Project impacts on species on the CESA endangered list or threatened list would be considered significant. Impacts on Species of Special Concern would be considered significant under certain circumstances, as discussed below.

### *3.2.2 Fish and Game Code Sections 3503, 3511, 4700, 5050, and 5515*

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.3 of the California Fish and Game Code prohibits take, possession, or destruction of any raptor (birds of prey) in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Any loss of fertile eggs or nesting raptors, or any activities resulting in nest abandonment, would constitute a

significant impact. Project impacts on birds of prey would not be considered "significant" unless the species are known or have a high potential to nest on the project site or rely on it for primary foraging.

CDFW Fully Protected Species may not be taken or possessed at any time without a permit from CDFW (Section 3511 Birds, Section 4700 Mammals, Section 5050 Reptiles and Amphibians, and Section 5515 Fish).

### *3.2.3 State Regulation of Wetlands and Other Waters*

The state's authority in regulating activities in wetlands and waters in the project area resides primarily with the State Water Resources Control Board (SWRCB). The SWRCB, acting through the RWQCB, must certify that a USACE permit action meets state water quality objectives (CWA Section 401). Any condition of water quality certification is then incorporated into the USACE Section 404 permit authorized for the project.

The SWRCB and RWQCB also have jurisdiction over waters of the state under the Porter-Cologne Water Quality Control Act (Porter-Cologne – described in more detail below). The SWRCB and RWQCB evaluate proposed actions for consistency with the RWQCB's Basin Plan, and authorize impacts on waters of the state by issuing Waste Discharge Requirements (WDR) or in some cases, a waiver of WDR.

BCDC has jurisdiction over coastal activities occurring within the San Francisco Bay area and Suisun Marsh. BCDC was created by the McAteer-Petris Act (California Government Code Sections 66600−66682). BCDC regulates dredging and filling and public access within 100 feet of the mean high tide line within San Francisco Bay. BCDC has jurisdiction over all areas of the bay that are subject to tidal action, including subtidal areas, intertidal areas, and tidal marsh areas that are between mean high tide and 5 feet above mean sea level. BCDC's permit jurisdiction does not extend to federally owned areas, such as Golden Gate National Recreation Area lands, because they are excluded from state coastal zones pursuant to the Coastal Zone Management Act of 1972 (CZMA). However, the CZMA requires that all applicants for federal permits and federal agency sponsors obtain certification from the state's approved coastal program that a proposed project is consistent with the state's program. In San Francisco Bay, BCDC is charged with making this consistency determination.

*Marine Life Management Act*

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Management Act. This law directs CDFW and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well license aquaculture operations. CDFW, through the commission, is the state's lead biological resource agency and is responsible for enforcement of the state endangered species regulations and the protection and management of all state biological resources.

*California Porter-Cologne Water Quality Control Act*

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for protection of the quality of all waters of the State of California for use and enjoyment by the people of California. San Francisco Bay waters are under the jurisdiction of the RWQCB, which established regulatory standards and objectives for water quality in the Bay in the Water Quality Control Plan for the San Francisco Bay Basin, commonly referred to as the Basin Plan.[35] Please refer to Section 5.16.2 (in Section 5.16, Hydrology and Water Quality) for further description.

## 3.3 Local Regulations and Marine Resource Plans

*San Francisco General Plan*

The following objectives and policies related to marine biological resources protection in the Environmental Protection Element of the *San Francisco General Plan* are relevant to the proposed project:

**Bay, Ocean and Shorelines**
***Objective 3*:** Maintain and improve the quality of the bay, ocean, and shoreline areas.

*Policy 3.1*: Cooperate with and otherwise support regulatory programs of existing regional, State, and Federal agencies dealing with the Bay.

**Ocean and Shorelines**
*Policy 3.2*: Promote the use and development of shoreline areas consistent with the General Plan and the best interest of San Francisco.

*San Francisco Bay Plan and San Francisco Waterfront Special Area Plan*

In 1968, the BCDC completed and adopted *the San Francisco Bay Plan* (Bay Plan). The Bay Plan has been periodically amended over the past 40 years.[36]

In 1975, BCDC, the City and County of San Francisco, and the Port of San Francisco adopted the San Francisco Waterfront Special Area Plan. The Special Area Plan, together with the McAteer-Petris Act and the Bay Plan and subsequent amendments to all three documents, prescribes a set of rules for non-maritime shoreline development along the San Francisco waterfront.

Several policies of the Bay Plan are aimed at protecting the Bay's water quality, ecology, and guiding the dredging activities of the Bay's sediment.

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[35] San Francisco Regional Water Quality Control Board (RWQCB), *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), www.swrcb.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf , December 31, 2010.

[36] San Francisco Bay Conservation and Development Commission (BCDC), Bay Plan, www.bcdc.ca.gov/pdf/planning/plans/bayplan/bayplan.pdf, adopted in 1968, amended through 2008.

The *San Francisco Bay Plan* specifies goals, objectives, and policies for existing and proposed waterfront land use and other areas under the jurisdiction of BCDC. Major policies of the *San Francisco Bay Plan* applicable to wildlife include the following:

5. Effects of Bay Filling. Bay filling should be limited to the purposes listed above, however, because any filling is harmful to the Bay, and thus to present and future generations of Bay Area residents. All Bay filling has one or more of the following harmful effects:
    a. Filling destroys the habitat of fish and wildlife. Future filling can disrupt the ecological balance in the Bay, which has already been damaged by past fills, and can endanger the very existence of some species of birds and fish. The Bay, including open water, mudflats, and marshlands, is a complex biological system, in which microorganisms, plants, fish, waterfowl, and shorebirds live in a delicate balance created by nature, and in which seemingly minor changes, such as a new fill or dredging project, may have far-reaching and sometimes highly destructive effects.

*San Francisco Bay Subtidal Habitat Goals Project*

In 2010, BCDC, the California Ocean Protection Council/California State Coastal Conservancy, the NOAA, and the San Francisco Estuary Partnership, in collaboration with each other and the broader scientific community, managers, restoration practitioners, and stakeholders, published a set of restoration planning goals and guidelines for the subtidal areas and habitats of the San Francisco Bay.[37]

Subtidal habitat consists of all the submerged area beneath the Bay water's surface and includes mud, shell, sand, rocks, artificial structures, shellfish beds, submerged aquatic vegetation, macroalgal beds, and the water column above the bay bottom. Submerged habitats are important for threatened species such as green sturgeon and Chinook salmon, commercial species like Dungeness crab and Pacific herring, and a host of other fish, shrimp, crabs, migratory waterfowl, and marine mammals.

The San Francisco Bay Subtidal Habitat Goals Project takes a Baywide approach in setting science-based goals for maintaining a healthy, productive, and resilient ecosystem. Where possible, these subtidal goals are designed to connect with intertidal habitats and with goals developed by other projects, including goals for Baylands and upland habitats. The goals and recommendations contained within the Subtidal Habitat Goals Project are not binding by regulation but rather are intended to serve as guidance to local, state, and federal agencies when evaluating projects and their potential ecological effects, and when issuing permits.

[37] San Francisco Bay Subtidal Habitat Goals Project, San Francisco Bay Subtidal Habitat Goals Report – Conservation Planning for the Submerged Areas of the Bay; 50-Year Conservation Plan, http://www.sfbaysubtidal.org/report.html, 2010.

The principal habitat conservation goals included in the Subtidal Habitat Goals Report that apply to the project site include:

Soft Substrate

- Promote no net increase to disturbance to San Francisco Bay soft bottom habitat
- Promote no net loss to San Francisco Bay subtidal and intertidal sand habitats

Rock Habitats

- Promote no net loss of natural intertidal and subtidal rock habitats in San Francisco Bay

Artificial Structures

- Enhance and protect habitat function and the historical value of artificial structures in San Francisco Bay
- Improve San Francisco Bay subtidal habitats by minimizing placement of artificial structures that are detrimental to subtidal habitat function

Shellfish Beds

- Protect San Francisco Bay native shellfish habitats (particularly native oyster Ostrea lurida) through no net loss to existing habitats

Submerged Aquatic Vegetation

- Protect existing eelgrass habitat in San Francisco Bay through no net loss to existing beds

Macroalgal Beds

- Protect San Francisco Bay Fucus beds through no net loss to existing beds
- Protect San Francisco Bay Gracilaria beds through no net loss to existing beds

# 4. POTENTIAL PROJECT EFFECTS

It is possible that the proposed project could adversely affect, either directly through habitat modification, species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service, and could have an adverse effect on sensitive natural communities.

## 4.1 Special-status Fishes and Marine Mammals

Species considered special-status that have a moderate or high potential to occur and to be exposed to project effects are as follows:

### *4.1.1 State- or Federally Listed or Recently Delisted Species*

- Chinook salmon (Sacramento River spring- and winter-run, Central Valley spring- and fall-run)
- Green sturgeon
- Steelhead trout (Central Valley and Central California Coast)
- Longfin smelt

### *4.1.2 Other Special-Status Species*

- Protected marine mammals: Pacific harbor seal, California sea lion, and harbor porpoise
- Magnuson-Stevens Act managed fish species: northern anchovy, Pacific sardine, English sole, sand sole, curlfin sole, Pacific sanddab, starry flounder, lingcod, brown rockfish, pacific whiting, kelp greenling, leopard shark, spiny dogfish shark, soupfin shark, skates, bocaccio, and cabezon
- Pacific herring
- Dungeness Crab

## 4.2 Potential Adverse Effects

**Effect No. 1 - Effects on Open Water (Pelagic) and Unconsolidated Bottom Sediment (Demersal) Habitat of Central Bay**

The open water (pelagic) and soft unconsolidated sediment (demersal) areas of the Central Bay are identified as critical habitat for winter- and spring-run Chinook salmon, steelhead trout, and green sturgeon. These areas are also listed as essential fish habitat for the 20 identified Fish Management Plan-managed fish taxa and contain spawning and foraging habitat for Pacific herring. Pacific harbor seals and harbor porpoises are year-round residents in the project area's Bay waters, and California sea lions are present throughout most of the year.

Project-related in-water activities may result in the following ecological effects:

- Resuspension of sediment from removal of piles, removal of marine structures and dredging. These activities may result in limited, short-term, localized turbidity of Bay waters and possible reduced plankton productivity.
- Proposed dredging can be expected to result in the temporary loss of foraging habitat for some fish and marine mammal species, cause short-term and localized increased water turbidity and exposure to sediment-affiliated organic and inorganic contaminants from resuspended sediments, and fish entrainment.

- Float installation can be expected to alter sediment composition of the seafloor in the immediate vicinity of the float by altering wave and current action and the depositional/erosional behavior of the moving water. This would result in altered ecological characteristics of seafloor habitat, altered biological communities, and potential foraging habitat adjacent to and under the float.

- Installed lighting on the float would cause increased nighttime illumination of Bay waters, which may alter normal fish behavior and increase bird, fish, and marine mammal predation on some fish species.

- Installation of 24- inch concrete and 48- inch steel piles would result in the loss of benthic habitat and, during installation, and increased noise levels (associated with pile driving) that can be fatal and/or harmful to fish and marine mammals.

- Float installation and long-term operation will promote biological growth where the float is within the water column. Biological fouling of the exposed surface area will include growth of aquatic vegetation and invertebrate communities that serve as fish forage habitat. With biological fouling and sedimentation, the water column between the float and mudline will decrease causing a reduced migratory route area.

The following discussions address the potential effect of these project-related ecological changes on Bay waters and their potential effects on identified sensitive species.

**Disturbed Habitat.** Dredging would result in the short-term loss of less than 1 acre of unconsolidated fine sand-mud substrate essential fish habitat/critical habitat and associated benthic infaunal community. Additionally, the installation of concrete and steel pilings would result in the burial and loss of essential fish habitat/critical habitat. Although it is unknown at this time the approximate acreage and elevation necessary for dredging, a conservatively high estimate of 0.7 acres which includes area under and adjacent to the float location as well as acreage associated with installation of ten 48 -inch piles and one 24- inch pile would result in the loss of less than 0.01 acre. Total habitat loss from project activities is estimated at fewer than 0.71 acres. It should be noted that removal of the old pier structures and parking lot will account for 0.3 acres of fill removed.

Altering benthic habitat and associated infaunal and epifaunal communities can result in the loss or reduction of suitability as fish foraging habitat, especially for sensitive species including salmon, steelhead, green sturgeon, longfin smelt and groundfish. The current benthic community inhabiting the Port area of Central Bay is identified as Marine Muddy and is characterized by the polychaetes *Euchone liminicola* and *Mediomastus spp.* and six species of amphipods, including *Corophium heteroceratum, C. acherusicum, C. insidiosum, C. spp. Photis spp., Ampelisca abdita*.

This community and the fine sand-mud sediment it inhabits is one of the most common in the San Francisco Bay and the Central Bay in particular. Following proposed construction activities such as pile installation and dredging, the deposition of fine sand-mud sediments, comparable

to pre-existing conditions, would begin almost immediately, and the benthic community inhabiting those sediments would be expected to recover composition and abundances within a few months to under two years, depending on when dredging occurs and other ecological factors affecting recolonization.

**Exposure to potentially Contaminated Sediments.** The presence of organic or inorganic contaminants in Bay sediments at concentrations high enough to result in detectable increased loading of contaminants to Bay waters and therefore pose a threat to marine biota is not expected, either from dredging activities or placement/removal of pilings and marine structures. As part of the permitting process for dredging within San Francisco Bay, representative samples would be required to be collected for physical, chemical, toxicity, and bioaccumulation to assess the quality of sediment and determine the suitability for each disposal option permitted. Under the proposed project, dredging has not been conducted within this area and would be considered "new work" by the regulatory agencies and thus disposal of all dredged sediments would be required to be placed either at an approved offshore disposal site or beneficial reuse site depending on the suitability of the material. If analytical analysis shows that either organic or inorganic chemicals are exhibited in sediments at unacceptable concentrations for any aquatic or beneficial reuse site, adherence to the LTMS-required best management practices (BMPs) for dredging and disposal procedures (e.g., use of silt curtains, upland disposal) would ensure that any potential effects from the resuspension of organic or inorganic contaminants from dredging would not be substantial.

**Resuspended Sediments**. Sediments resuspended in the water column from dredging would be expected to remain in the water column for a relatively short time period, occurring during those days dredging is occurring. Some resuspension of sediments would also occur during pile removal and marine structure removal operations. All in-water construction activities would comply with USACE, USEPA, Regional Water Quality Control Board, and BCDC regulations and provisions in issued permits concerning best management practices for avoiding or reducing potential impacts related to resuspended sediments. The wind waves and tidal currents present along waterfront piers can be expected to quickly dissipate any turbidity plumes generated from dredging operations and to minimize any effect on marine habitats and biota. Increased turbidity from construction activities is not expected to have a substantial effect on plankton productivity, since the shallow Bay waters adjacent the waterfront are naturally turbid with light penetrating less than a few feet from the surface. The use of clamshell dredging of Port slips and open water areas is consistent with routine maintenance and new channel/harbor dredging methodologies currently employed throughout the Bay annually and have been evaluated in the development of the LTMS for dredging in San Francisco Bay. Strict adherence to best management procedures for avoiding or reducing suspended sediments and its potential effect on marine biota would ensure that the adverse effects would not be substantial.

**Increased Water Shading.** The installation of the float, pier, and access ramp would create 20,437 square feet, or approximately 0.47 acres, of shadow fill. Removal of the old piers and parking lot would account for 7,800 square feet (0.18 acres) for a net increase of shadow fill of 12,637 sf (0.29 acres).

Overwater structures can alter the physical ecological conditions present under them, including increasing the deposition of sediments and thereby reducing water depth and the grain size composition of seafloor sediments and therein the composition of benthic infaunal communities, and reducing the penetration of ambient light into Bay waters. Decreased light penetration into Bay waters can have an effect on phytoplankton production and the presence and growth of marine algae. Shade cast from docks, piers, and pilings has been shown to reduce the amount of ambient light within the marine environment, affect invertebrate and vertebrate community composition, and create behavioral barriers that can deflect or delay fish migration, reduce fish prey forage, and alter predator-prey relationships over normal open-water conditions.

The Bay waters are daily subject to high wave and tidal currents that maintain seafloor sediments and sediments in suspension, resulting in turbid water that are naturally limiting to ambient light penetration and phytoplankton production. Based on existing conditions at the project location, the potential effect of shading on sensitive species is expected to be relatively minor.

**Marine Wildlife Entrainment.** Dredging of Bay sediments by either hydraulic suction or clamshell dredging equipment has the potential to entrain (directly remove) fish, benthic infauna, and mobile epibenthic (on the sediment surface) invertebrates, such as Dungeness crab. Of these three, clamshell dredging has the lowest occurrence of fish and Dungeness crab entrainment, since these animals are generally capable of sensing the pressure wave that precedes the clamshell bucket traveling through the water column, can actively avoid the bucket, and generally avoid the active dredging site because of increased seafloor turbidity and noise. The LTMS within its EIS/EIR evaluated the potential entrainment of special-status and sensitive fish and invertebrate species by in-Bay dredging activities. To prevent and minimize entrainment of fish and invertebrates, the LTMS established BMPs for Bay dredging that include environmental work windows, restricted in-Bay disposal, and limits on overflow dredging and lowering hydraulic dredge heads when priming. All proposed dredging in support of the project would be conducted with a clamshell dredge, employ offshore disposal, and restrict overflow dredging, and would be conducted within the environmental work windows identified in the LTMS. If the project sponsor needed to revise these methods, they would need to proceed with formal permitting for each regulatory agency and specify the requested revisions to methodologies and provide supporting environmental documentation. The agencies comprising the Dredge Material Management Office would need to be consulted through standard permitting process.

It should be noted that the LTMS environmental assessment and guidelines were established prior to green sturgeon being listed as a FESA-protected species on April 7, 2006 and longfin smelt as a CESA-protected species on June 25, 2009, and the recent decision by the USFWS to consider protection of longfin smelt under FESA on March 10, 2011. Although all of San Francisco Bay is listed as Critical Habitat for green sturgeon, their actual distribution and use of habitats throughout the Bay is unknown. Based on recent Interagency Ecological Program bottom trawl data, green sturgeon are either present in low numbers in the Central Bay or are adept at avoiding capture by bottom trawls. There is limited evidence of sturgeon entrainment

during dredging and no known sturgeon entrainment incidents within San Francisco Bay. With the employment of mechanical clamshell dredging equipment, which has been documented to be less a threat to fish entrainment than hydraulic dredging, for planned dredging activities, the potential risk to green sturgeon entrainment is estimated to be relatively low.

Longfin smelt are found throughout the San Francisco Bay, using the deeper, cooler waters of the Central Bay during the warmer months of the year. They can be found throughout the water column in Central Bay and are reported to concentrate at deeper colder water depths. Historic evidence of entrainment suggests they are more susceptible to suction dredging than mechanical dredging techniques, such as clamshell dredges. This has been attributed to avoidance due to increased turbidity and suspended sediments as a result of physical disturbances of bottom substrate and avoidance of low-frequency vibration caused by lowering the bucket into the water. Based on the Central Bay location of proposed dredging, dredging during the late summer and fall months in accordance with LTMS-approved environmental work windows, the low risk of entrainment posed by clamshell dredging, and the absence of the most sensitive life history stage (smelt eggs) in the Central Bay during summer and fall months when dredging would occur, the potential threat to longfin smelt is expected to be relatively low.

**Increased Nighttime Artificial Illumination of Water.** Increased artificial illumination of Bay waters at night can alter normal swimming and foraging behavior of fish, marine mammals, and seabirds. Many pelagic schooling fish, such as sardines and herring, are attracted to illumination cast by boats and offshore structures and are frequently subject to increased predation from other fish species as well as marine birds and occasional marine mammals. Measures that are often used to minimize impacts of artificial night lighting on birds, fish, and marine mammals include installation of dock lighting that is low to the dock surface; uses low-voltage, sodium, or non yellow-red spectrum lights; and is well shielded to restrict the transmittance of artificial light over the water. The potential for effects on sensitive species from artificial night lighting on temporary floating docks installed and used during activities would be relatively low with the implementation of best practices, as described below.

**Noise.** Concrete and steel piles that are driven within the water column can produce high-intensity noise resulting in damage to soft tissues, and/or result in harassment of fish and marine mammals such that they alter swimming, sleeping, or foraging behavior or abandon temporarily forage habitat. Potential water-borne noise effects are described in a project-specific noise and vibration technical report. Probable best practices to be implemented, based on recent monitoring results from projects within San Francisco Bay, fish kills or injuries are not anticipated during pile driving activities. Consistent with best management practices for pile-driving (discussed further below), sound monitoring will be implemented during pile driving with an impact hammer to confirm that noise levels remain below established thresholds. The striking of a pile by a pile-driving hammer creates a pulse of sound that propagates through the pile, radiating out through the water column, seafloor, and air. Sound pressure pulses, as a function of time are referred to as a waveform. Peak waveform pressure underwater is typically expressed in decibels (dB) referenced to 1 micro Pascal (µPa). Sound levels are generally reported as peak levels (peak) and sound exposure levels (SEL). In addition to the pressure

pulse of the waveform, the frequency of the sound, expressed in Hertz (Hz) is also important to evaluating the potential for sound impacts. Low frequency sounds are typically capable of traveling over greater distances with less reduction in the pressure waveform than high frequency sounds.

Vibratory pile drivers work on a different principle than pile-driving hammers and produce a different sound profile. A vibratory driver works by inducting particle motion to the substrate immediately below and around the pile causing liquefaction of the immediately adjacent sediment, allowing the pile to sink downward or to be removed. Vibratory pile driving is only suitable where soft substrate is present. The noise produced by vibratory drivers driving concrete and steel piles in water range between 165-195 dB (Peak) and 150-180 dB (SEL)[38] at a distance of 10 meters. These sound levels are typically 10-20 dB lower in intensity relative to the higher, pulse-type noise produced by an impact hammer.[39] The distances at which potential impacts to fish species and marine mammals could occur as a result of proposed pile installation activities are analyzed in detail in the Noise and Vibration Technical Memo completed for the proposed project by Wilson Ihrig.[40]

All of the piles within the old pier and parking lot demolition would be removed with vibratory pile-drivers. The 48 inch and 24 inch piles proposed for installation of the pier and float would also be installed with a vibratory pile driver, though it is possible that a pile-driving hammer would need to be deployed for at least part of the process. Pile-driving activities have the potential to result in substantial acute barotrauma or alteration of normal fish and marine mammal behavior, such as foraging or swimming, to sensitive fish species and marine mammals that are present in the Bay waters up to 4 miles (6 kilometers) from the pile-driving activities.[41,42]

Potential pile driving noise impacts could cause adverse effects but these effects would be reduced by implementation of established BMPs for pile driving as detailed below.

The occurrence of special-status aquatic species within the project area may occur but would be temporary in nature. Short-term adverse effects on special-status fishes and other aquatic biological resources could occur from pile driving, dredging (clamshell), and other in-water

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38 Caltrans. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Final Report. Prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth and Rodkin, Inc. February 2009. http://www.dot.ca.gov/hq/env/bio/files/Guidance_Manual_2_09.pdf.

39 Ibid.

40 Wilson Ihrig. 2018. Pier 22.5 Fire Station 35 Project Noise and Vibration Technical Memo.

41 Kastlelein, R.A, S. van der Heul, W. C. Verboom, R. J. V. Triesscheijn, and N.V. Jennings, The Influence of Underwater Data Transmission Sounds on the Displacement Behaviour of Captive Harbour Seals (Phoca vitulina). Mar. Env. Res. 61 (2006). 19-39, 2006.

42 San Luis and Delta Mendota Water Authority and C.H. Hanson, Georgina Slough Acoustic Barrier Applied Research Project: Results of 1994 Phase II Field Tests, Interagency Ecological Program for the San Francisco Bay/Delta estuary, Technical Report 44, May 1996.

construction activities. The effects that are typically associated with these activities include temporary elevated sound pressure levels associated with pile-driving, loss of benthic habitat and associated benthos, and short-term loss and disruption of potential fishery habitat. However, if in-water construction activities are restricted to a National Marine Fisheries approved environmental work window between June 1 – November 30 when special-status aquatic species are least likely to be present in the study area, then adverse effects would be less likely to occur. Table 3 provides these established work windows that set precedence for protection of species within San Francisco Bay. Implementation of the best practices below will ensure that, if special-status aquatic species are present within the project area during in-water construction, the effects on these species will be minimized or avoided.

**Special-status and Migratory Birds.** Disruption of nesting migratory or native birds is not permitted under the federal MBTA or the California Fish and Game Code, as it could constitute unauthorized take. Compliance with existing state and federal regulations, as well as the overall lack of suitable habitat within the project area, would likely prevent adverse effects on nesting birds. Implementation of best practices, Nesting Bird Protection Measures (below) would ensure that the proposed project would not have an adverse effect on nesting birds by providing pre-construction nesting surveys, and establishing no-work buffer zones around any active nests identified on or near the project sites.

**Invasive Species**.

Maintenance of piles, floats, and other In-water structures may enable the spread of invasive species. The predominant invasive marine algal species of concern in San Francisco Bay is *Undaria pinnatifida* (*Undaria*), also known as Asian Kelp, or Wakame. *Undaria* is a fouling species and can be transported around through the movement of underwater infrastructure to which it has attached. If it spreads further within the bay *Undaria* poses a risk of altering the existing algae complexes that support the marine communities of the San Francisco Bay. *Undaria* is not yet widely spread throughout the San Francisco Bay, but it has been found on structures and floats along the Port's waterfront. Careful manual removal and containment of *Undaria* before it is disturbed for dislodged by maintenance or construction activity can reduce the risk of dispersion and proliferation.

### *4.2.1 Best Practice: Construction Activities*

Construction activities shall avoid or minimize adverse effects on jurisdictional waters to the full extent feasible. Specifically:

- A Spill Prevention Control and Countermeasure (SPCC) Plan will be prepared by the selected contractor to address the emergency cleanup of any hazardous material and will be available on site. The SPCC will be submitted to the Project sponsor and RWQCB for review and approval.

- The party undertaking construction work will exercise every reasonable precaution to protect listed species and EFH-protected species and their habitat(s) from construction by-products and pollutants such as demolition debris, construction chemicals, fresh cement, saw-water, or other deleterious materials. Construction may be conducted from both land and water as deemed appropriate by the Project sponsor. Care will be used by equipment operators to control debris so that it does not enter the Bay.

- A Materials Management Disposal Plan (MMDP) will be prepared by the selected contractor to prevent any debris from falling into the Bay during construction to the maximum extent practicable. The measures identified in the MMDP will be based on the Best Available Technology, and will include, but not be limited to, the following measures:

    - During construction, the barges performing the work will be moored in a position to remove, capture and contain any debris generated during any structure or pile removal or in-water work. In the event that debris does remain in or reach the Bay, personnel in workboats within the work area will immediately retrieve the debris for proper handling and disposal. All debris will be disposed of at an authorized upland disposal site;
    - Measures to ensure that fresh cement or concrete will not be allowed to enter San Francisco Bay. Construction waste will be collected and transported to an authorized upland disposal area, as appropriate, and per federal, state, and local laws and regulations;
    - All hazardous material will be stored upland in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use will be permitted with the same anti-spill precautions;
    - All construction material, wastes, debris, sediment, rubbish, trash, fencing, etc., will be removed from the site once the proposed project is completed and transported to an authorized disposal area, as appropriate, in compliance with applicable federal, state, and local laws and regulations;
    - Construction material will need to be covered every night and during any rainfall event (if there is one);
    - Construction crews will reduce the amount of disturbance within the project site to the minimum necessary to accomplish the project; and
    - Measures to prevent site water (e.g., dust suppression water, water from sawcutting, etc.) from entering the Bay.

The MMDP will be submitted to the RWQCB for review and approval.

- Vessels and equipment that rely on internal combustion engines for power and/or propulsion will be kept in good working condition, and compliant with California emission regulations.

Vehicles and equipment that are used during the course of construction will be fueled and serviced off-site, with the exception of small amounts of oil/gas for small generators, and cranes on barges, using 55 gallon drums, etc. Fueling locations will be inspected after fueling to document that no spills have occurred. Any spills will be cleaned up immediately. No in-water fueling will be permitted in accordance with the site-specific SPCC.

### *4.2.2 Best Practice: Pile Driving*

The avoidance and minimization measures specific to pile driving activities, below, have been developed in accordance with the majority of the measures outlined in the 2013 NLAA Programmatic criteria, in order to reduce project effects on sensitive resources. Avoidance and minimization measures that will reduce project noise effects include the following:

- All in-water construction (i.e., pile driving and dredging) will be conducted within the established Bay area environmental work windows between June 1 and November 30 in order to avoid potential impacts to fish species for this area of San Francisco Bay. These windows were promulgated in a programmatic biological opinion (NMFS and CDFW) for the Long Term Management Strategy (LTMS) program for managing sediment within the San Francisco Bay.
- The project sponsors shall consult with NMFS and obtain an Incidental Harassment Authorization under the Marine Mammal Protection Act covering all project activities. The project sponsors shall comply with and implement any measures that result from the consultation and Incidental Harassment Authorization issuance for the Project.
- The project sponsor will develop a NMFS-approved sound monitoring plan prior to the start of pile driving. This plan will provide detail on the methods used to monitor and verify sound levels during pile driving activities. The sound monitoring results will be made available to NMFS.
- Vibratory pile drivers may be used for the installation of steel pilings (48-inch diameter). Vibratory pile driving will be conducted following the USACE “Proposed Procedures for Permitting Projects that will Not Adversely Affect Selected Listed Species in California”. USFWS and NMFS completed section 7 consultation on this document which establishes general procedures for minimizing impacts to natural resources associated with projects in or adjacent to jurisdictional waters.[43]
- A “soft start” technique to impact hammer pile driving will be implemented, at the start of each work day or after a break in impact hammer driving of 30 minutes or more, to give fish and marine mammals an opportunity to vacate the area.
- During the use of an impact hammer, a bubble curtain or other sound attenuation method will be utilized to reduce sound levels. If NMFS sound level criteria are still exceeded with the use of attenuation methods, the contractor will revise sound attenuation methods as per the approved sound monitoring plan. A NMFS-approved

[43] NOAA. 2007. Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay. August.

biological monitor will be available to conduct surveys before and during pile driving to inspect the work zone and adjacent Bay waters for marine mammals. The monitor will be present as specified by NMFS during impact pile-driving phases of construction.

- Maintain the safety zones established in the sound monitoring plan around sound source, for the protection of marine mammals in association with sound monitoring station distances, as approved by NMFS.
- Halt work activities when a marine mammal enters the Level A safety zone and resume only after the animal has been gone from the area for a minimum of 15 minutes.
- Maintain sound levels below 90 dBA in air when pinnipeds (seals and sea lions) are present.

### *4.2.3 Best Practice: Dredging*

- The project sponsor will require the selected contractor to use clamshell dredging equipment and conduct dredging between June 1 and November 30 in accordance with LTMS dredging windows to minimize potential adverse effects on fish and invertebrate species.
- The project will not require in-water work during the Pacific herring spawning or hatching season (December 1 – February 28); hence, no avoidance and minimization measures are required for this species.

### *4.2.4 Best Practice: Night Lighting*

- The project sponsor shall install lighting that minimizes artificial lighting of Bay waters by using shielded, low-mounted, and low light-intensity fixtures and bulbs.

### *4.2.5 Best Practice: Nesting Bird Protection Measures*

Nesting birds and their nests shall be protected during construction by use of the following measures:

- A qualified biologist shall conduct pre-construction nesting survey during the avian nesting breeding season (approximately February 15 to September 15) within 7 days prior to construction. Surveys shall be performed for the project site, vehicle and equipment staging areas, and suitable habitat within 250 feet to locate any active passerine (perching bird) nests and within 500 feet to locate any active raptor (bird of prey) nests.
- If active nests are located during the pre-construction nesting bird surveys, the qualified biologist shall evaluate if the schedule of construction activities could affect the active nests and the following measures shall be implemented based on their determination:
    a. If construction is not likely to affect the active nest, construction may proceed without restriction.

b. If it is determined that construction may affect the active nest, the qualified biologist shall establish a no-disturbance buffer around the nest(s) and all project work would halt within the buffer until a qualified biologist determines the nest is no longer in use.

c. At the discretion of the biologist and in coordination with CDFW, modifications of buffer distances and construction methods in proximity to active nests may be conducted. Necessary actions to remove or relocate an active nest(s) or other modifications shall be coordinated with CDFW.

#### 4.2.6 Best Practice: Invasive Species Control Measure

Before any existing infrastructure (e.g., floating docks, moorings, mooring floats and anchor lines) from other parts of the bay or elsewhere might be installed within Port jurisdiction, it will be cleaned off-site using high pressure washers or steam cleaners, with all wastewater and material from cleaning being captured to prevent it from re-entering the Bay.

Before removing or moving any piles, floats, or other predominantly submerged structures, maintenance personnel will examine the area for presence of *Undaria* and if present remove as follows:

1. A diver carefully places a small (e.g. 2-gallon) plastic bag around the algae until the bag is nearly flush with the structure. Using a hand-held scraping tool (e.g. putty knife), the diver removes the algae from its base, where it is attached to the structure, capturing all algae in the bag.
2. The bag is tightly closed and brought to the surface for disposal.
3. Equipment used in the water during *Undaria* removal will be thoroughly rinsed with fresh water between uses at different locations. Rinse water will not be allowed to drain to the bay.

If this measure is not feasible or applicable to a particular task, the float operator or entity responsible for performing maintenance may propose alternative methods for Port review and approval.

**Effect No. 2 - The proposed project could have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.**

Proposed in-water construction could result in substantial adverse effects to waters of the U.S. under the jurisdiction of the USACE, waters of the State under the jurisdiction of the San Francisco Regional Water Quality Control Board, and waters and land under the San Francisco Bay Conservation and Development Commission and State Lands Commission jurisdiction. Potential adverse effects resulting from construction activities include, but are not limited to, permanent fill, temporary disturbance of jurisdictional waters, degradation of water quality and aquatic habitat, and accidental discharge of sediment or toxic materials. As such, the Best Practice Construction Activities, Pile-Driving, and Dredging (described above) would be required to reduce potential adverse effects.

**Effect No. 3 - The proposed project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites.**

The proposed float would be located at a pivot point along the San Francisco Shoreline. The Central Bay and San Francisco shoreline is a thoroughfare for all migrating fish and invertebrate species transiting through the Bay to and from spawning habitat, nursery areas, or other forage areas within the Bay and out through the Golden Gate and open ocean. Due to their location, these project activities would potentially expose special-status and sensitive fish and marine mammals transiting from the South Bay and Central Bay and out through the Golden Gate to:

- Increased noise from, pile driving, and vessel traffic
- Increased resuspended sediments from pile removal and dredging
- Increased biofouling on the bottom of the float in conjunction with sedimentation would reduce the water column area that biological resources could utilize.

Special-status aquatic species utilize the San Francisco waterfront as a movement corridor. Pacific herring are known to occur along the San Francisco waterfront.

Of all special-status fish aquatic species, longfin smelt have the greatest likelihood for potential occurrence within the project area. Survey records from the CDFW IEP survey program routinely encounter longfin smelt within Central San Francisco Bay.[44] On average, between 2010 and 2014, the IEP midwater and bottom trawls captured approximately 33 fish/year, at the 7 monitoring stations in closest proximity to the project area combined. However, because longfin smelt distribution within the estuary is driven by fluctuations in salinity, they are unlikely to occur in large numbers within the project area outside of late-summer.

Since the site is located on an urban and industrialized waterfront and the area the float might influence in comparison to the available habitat is small, the proposed project would not interfere substantially with the movement of any native resident or migratory fish, or wildlife species, and any potential impacts would not be substantial.

**Effect No. 4 - The proposed project will not conflict with any local policies or ordinances protecting biological resources, including tree preservation policies and ordinances.**

The construction and operation of project would not conflict with any local policies or ordinances protecting biological resources.

**Effect No. 5 - The proposed project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan for upland resources.**

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[44] Interagency Ecological Program for the San Francisco Bay Estuary (IEP); San Francisco Bay Study. 2010-2014. 2014. Unpublished Raw Mid-water and Otter Trawl Data.

There are no adopted or approved habitat conservation plans or natural community conservation plans within the project area, and therefore there would be no conflicts.