

SECTION III.N BIOLOGICAL RESOURCES

III.N.1 Introduction

This section of the EIR discusses existing biological resources within and surrounding the Project site and examines the potential for the Project to (1) result in substantial and adverse direct, indirect, or cumulative impacts to sensitive biological resources (including plants, wildlife, aquatic species, and vegetation communities); (2) interfere substantially with the movement of native fish or wildlife species; (3) conflict with local policies or ordinances protecting biological resources; or (4) conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. This section analyzes both Project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid any identified significant impacts.

Due to the length and complexity of this section, an overall description of the format and structure of the Biological Resources discussion, as well as the general approach to the analysis, is provided to assist the reader in following the discussion. First, while the boundaries of the Project site include the landside areas (i.e., those areas landward of tidal waters) that are depicted on Figure II-2 (Project Site and Context) of Chapter II (Project Description) of this EIR, the Project could result in impacts to aquatic resources that are located directly adjacent to the Project site (in the San Francisco Bay) as the result of the Project's various waterside improvements, including the shoreline improvements required to stabilize and/or reinforce the shoreline, improvements required to provide a marina, and construction of the Yosemite Slough bridge (refer to Appendix N2 [Yosemite Slough Bridge Drawing]). Therefore, this discussion focuses on both on-site landside and off-site aquatic resources.

The Study Area for this biological resources analysis includes both developed and undeveloped portions of HPS Phase II and Candlestick Point, including the entire Candlestick Point State Recreation Area (CPSRA), as well as off-site open waters adjacent to the Project site that would be impacted by Project components (i.e., breakwater, pier, etc.); refer to Figure III.N-1 (Biological Resources Study Area). The off-site aquatic resources discussed include Yosemite Slough (except the area of construction), the open water area between Candlestick Point and HPS Phase II (known as South Basin), and adjacent open waters that would be impacted by Project components (i.e., breakwaters, gangways, floats, etc.). For purposes of the evaluation of sensitive species, the Study Area is defined as the Project site and a radius of up to 5 miles beyond the Project site.

The Setting discussion describes existing biological conditions, consisting of common plant and wildlife species and habitats, sensitive plant and wildlife species and habitats, and wildlife movement/habitat connectivity conditions. The discussion was prepared by first completing an extensive literature search of potential biological resources within the Study Area, followed by completing several field surveys to document the conditions that do exist or could exist, depending on the time of year. The Setting discussion describes certain biological resources that are defined by state or federal regulations; therefore, detailed descriptions of applicable regulations are provided in the Regulatory Framework section.



FIGURE III.N-1

Candlestick Point — Hunters Point Shipyard Phase II EIR BIOLOGICAL RESOURCES STUDY AREA

The Impact discussion parallels the Setting discussion in presentation, first by discussing impacts to common species or resources and discussing sensitive species or resources. This section identifies both Project-specific and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid the identified impacts.

III.N.2 Setting

In order to assess existing conditions and potential Project-related impacts, PBS&J staff biologists conducted reconnaissance-level surveys of the Project site on August 9, 2007, May 5, 2008, and July 8, 2008. Surveys focused on identification of vegetation communities, special-status species or their potential habitat, and other biotic resources (i.e., potential wetlands or “other waters” of the US). During surveys, biologists walked transects through each habitat type while recording plant and wildlife species observed in field notes. On July 8, 2008, Navy personnel escorted a PBS&J staff biologist through HPS Phase II. The August 2007 and July 2008 surveys were in the dry season, when most annual, biennial, and perennial herbaceous plant species were dormant or had already died back, leaving only dried plant parts (i.e., leaves, stems, fruits) for identification. Lastly, a rare plant survey was conducted in May 2008. The survey was conducted by walking representative transects through the survey area while recording every plant species observed. Although the survey was conducted within the flowering window for the special-status species that could occur within the Project site, the unusually dry weather resulted in a shorter flowering period and thus, most annual, biennial, and perennial herbaceous plant species were dormant or had already died back for the growing season, leaving only dried plant parts (i.e., leaves, stems, fruits) for identification. If a plant species could not be identified in the field, diagnostic plant structures (i.e., fruits or morphology) were collected for further analysis. Some plants observed during the survey could only be identified to the Genus level.⁶⁴⁰

The “baseline conditions” for this analysis are based on these field surveys, other data collected or research conducted within the Study Area over the past six years (2003–2009), and federal and state agency information resources. Sources consulted include the California Department of Fish and Game’s (CDFG) Natural Diversity Database (CNDDDB) for the US Geological Survey’s (USGS) 7.5-minute San Francisco South and Hunters Point quadrangles; the California Native Plant Society (CNPS) electronic inventory for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles; the US Fish and Wildlife Service (USFWS) Endangered and Threatened Species list for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles; the *Final Report Yosemite Slough Watershed Wildlife Survey*, LSA, July 2004; the *Final Draft Significant Natural Resource Areas Management Plan*, Sections 6.17 and 6.18, San Francisco Recreation And Park Department, February 2006; the *Draft Wetlands Mitigation and Monitoring Plan*, Navy Base Realignment and Closure Program, November 2006; the *Hunters Point Shipyard and Candlestick Point State Recreation Area, Natural Environment Study Report for the Bayview Transportation Improvements Project*, Jones & Stokes, June 2009; the *Final Delineation of Wetlands and Other Waters*, H.T. Harvey & Associates, Revised 13 July 2009 and October 13, 2009; the *Draft Sustainability Plan* for the Project, Arup North America Ltd, March 2009; PBS&J’s *Candlestick Point/Hunters Point Shipyard Biological Technical Report* prepared for the San Francisco Redevelopment Agency (refer to Appendix N1 [Biological

⁶⁴⁰ Plants that were identified to the Genus level are not special-status or rare plants, and, therefore, this taxonomic unit of classification does not affect the findings of this report.

Resources Technical Report]), San Francisco Planning Department, December 11, 2008 updated November 2, 2009; and Project plans and graphic renderings.

Information from these sources and from PBS&J's reconnaissance-level surveys were used to identify and characterize existing conditions at the Project site, and accordingly, were substantially relied upon for this analysis. In particular, LSA's Yosemite Slough Watershed Wildlife Survey (2004) and the Final Delineation of Wetlands and Other Waters conducted by H.T. Harvey & Associates (2009) provided specific information about the Study Area. LSA coordinated a wildlife survey of the Yosemite Slough Watershed between January 2003 and April 2004.⁶⁴¹ The survey of the Yosemite Slough Watershed included both the entire CPSRA and adjacent open water areas between HPS Phase II and the peninsula that forms the eastern extension of CPSRA.⁶⁴² From north to south, the Yosemite Slough Watershed Wildlife Survey Study Area is roughly bordered by Thomas Avenue, Ingalls Street, Carroll Avenue, Arelious Walkder Drive, Arelious Walker Drive, and the Hunters Point Expressway (Figure III.N-1). Although this survey covered only a portion of the Project site, it provides the most comprehensive data set available regarding the occurrence of wildlife in the area, and is thus cited heavily in the descriptions of existing conditions in this section. Also, because the majority of the Project site that was not covered by the Yosemite Slough Watershed Wildlife Survey is developed, we expect wildlife communities elsewhere on the Project site to be similar or depauperate in comparison to, those documented within the Yosemite Slough Survey's study area.

H.T. Harvey & Associates prepared a delineation of wetlands and other jurisdictional waters potentially meeting the regulatory definition of Waters of the United States within a majority of the Project site (February 2009 and revised on July 13 and October 13, 2009).⁶⁴³ Surveys were conducted in 2008 on September 25 and 26; November 5 and 6; and December 4, 5, and 19; and in 2009 on January 29 and 30 and May 20. The delineation included the examination of the above-mentioned areas for wetlands using the routine determination method outlined in the US Army Corps of Engineers (USACE) Wetlands Delineation Manual. H.T. Harvey assessed topographic features, drainages, potential alterations to site hydrology, and areas of significant recent disturbance, and mapped the High Tide Line (HTL). The USACE verified the findings of the delineation with a Jurisdictional Determination dated August 31, 2009. As indicated on Figure III.N-3 (Wetlands and Other Waters) later in this section, the study area for H.T. Harvey's original wetland delineation did not include several limited areas that are now considered part of the Project site. As a result, H.T. Harvey expanded its original delineation by inspecting these additional areas in the field on October 8, 2009. H.T. Harvey & Associates has amended its wetland delineation report, and verification of jurisdictional boundaries in these additional areas by the USACE is pending.

Existing conditions are described with respect to observed plant species, vegetation communities, common aquatic habitats (i.e., mud flats, open water, and eelgrass (*Zostera marina*) beds), common wildlife (i.e., invertebrates, reptiles and amphibians, birds, and mammals), common aquatic resources (i.e., fish, shellfish, and mollusks), and sensitive species and habitats (sensitive plants, sensitive vegetation

⁶⁴¹ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁴² Ibid.

⁶⁴³ H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

communities, sensitive wildlife [invertebrates, birds, terrestrial mammals, and marine mammals], and sensitive aquatic resources [mollusks, fish, and Essential Fish Habitat (see Sensitive Aquatic Resources)]).

■ Observed Plant Species

As described in Appendix N1 to this EIR, a total of 187 vascular plant species were observed within the Project site during all of the biological surveys listed in the Setting section above, 103 of which are non-native. In addition, 66 of the non-native vascular plant species are considered to be invasive plant species.⁶⁴⁴ Invasive plants are defined as those that were “moved by humans to another region.” These invasive plants have a competitive advantage because they are no longer controlled by their natural predators, and can quickly spread out of control.⁶⁴⁵ Widely scattered trees are present and appear to either be horticultural plantings associated with landscaping or represent locally naturalized specimens. Calflora’s on-line Plant Name Library was used for the scientific nomenclature for plant names in this section.⁶⁴⁶

■ Vegetation Communities

For purposes of the biological resources analysis, the Study Area is first described in terms of the vegetation communities it supports, as reflected by Table III.N-1 (Vegetation Communities within the Study Area) and further discussed below. The vegetation communities are defined according to CDFG Wildlife and Habitat Data Analysis Branch List of California Terrestrial Natural Communities,⁶⁴⁷ H.T. Harvey & Associates’ wetland delineation for HPS Phase II and Candlestick Point,⁶⁴⁸ and PBS&J’s Biological Technical Report prepared for the Project.⁶⁴⁹

As depicted in Figure III.N-2 (Study Area Habitats), the Study Area contains four non-aquatic vegetation communities: non-native annual grassland, landscaped areas/ornamental plants, salt marsh, and seasonal freshwater wetland. In addition, approximately 568.80 acres of the Study Area is “urban.” This habitat is not classified as a “vegetation community” and is thus not included in the “vegetation communities” table. Urban habitat includes developed or paved areas. The Study Area also contains three aquatic habitats: mud flats, eelgrass beds, and open waters. Table III.N-1 provides the total acreages of each vegetation community within the Study Area. A description of each of the vegetation communities follows this table.

⁶⁴⁴ California Invasive Plant Council (Cal-IPC) Invasive plant definitions 2009. Website: <http://www.cal-ipc.org/ip/definitions/index.php>. Accessed July 2009.

⁶⁴⁵ California Invasive Plant Council (Cal-IPC) Invasive plant definitions 2009. Website: <http://www.cal-ipc.org/ip/definitions/index.php>. Accessed July 2009.

⁶⁴⁶ Calflora, 2009. Website: <http://www.calflora.org/index.html>. Accessed July 2009.

⁶⁴⁷ California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database*, Wildlife and Habitat Data Analysis Branch, Sacramento, California, September 2003 edition.

⁶⁴⁸ H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

⁶⁴⁹ PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report*, prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009.

In some cases, vegetation communities may also be considered sensitive vegetation communities. In those cases, and there are three such cases in this analysis, they are also discussed under Sensitive Vegetation Communities, which follows this discussion. The three sensitive communities within the Study Area include salt marsh, eelgrass beds, and seasonal freshwater wetland habitats (also discussed under Sensitive Vegetation Communities).

Table III.N-1 Vegetation Communities within the Study Area				
Habitat Type	Candlestick Point	Hunters Point Shipyard	Yosemite Slough	Total Acreage
Non-native Annual Grassland ^a	30.53	44.19	—	74.72
Landscaped Areas/Ornamental Plants ^a	44.67	—	—	44.67
Salt Marsh ^b	0.93	3.56	0.06	4.55
Seasonal Freshwater Wetland ^b	—	0.20		0.20
Mud Flats/ Open Water*	21.82	169.29	4.43	195.54
Totals	97.95	217.24	4.49	319.68

SOURCES:

- a. PBS&J, *Bayview Waterfront Project Biological Technical Report* prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009, which is provided as Appendix N1 to this EIR.
- b. H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California*, February 2009 and revised July 13 and October 13, 2009.

Acreage discrepancies between the data contained herein and the total approximate acreage of the Study Area are due to the conversion of data from non-GIS to GIS data.

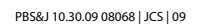
This table does not include the acreage for developed/urban areas (568.80 acres) because this classification is not a recognized vegetation community for purposes of this EIR.

* The open waters located outside of the Project boundary include those adjacent to Candlestick Point, Hunters Point Shipyard, and Yosemite Slough.

Non-native Annual Grassland

Patches of non-native annual grassland habitat are found throughout the Project site and comprise 74.72 acres. Invasive, non-native grasses characterize this community, particularly at HPS Phase II due to the intensive disturbance associated with the Navy's ongoing remediation efforts. The vegetation within this grassland consists of a mixture of invasive annuals such as wild oat (*Avena fatua*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), rat-tail fescue (*Vulpia myuros*), and hare barley (*Hordeum murinum* var. *leporinum*). Broad-leaf species occurring within the grasslands consist of wild radish (*Raphanus sativus*), painted charlock (*R. raphanistrum*), black mustard (*Brassica nigra*), Mediterranean linseed (*Bellardia trixago*), cut-leaf plantain (*Plantago coronopus*), spring vetch (*Vicia sativa*), red valerian (*Centranthus ruber*), and Italian thistle (*Carduus pycnocephalus*). Additionally, garland chrysanthemum (*Chrysanthemum coronarium*) has naturalized across much of the grasslands and showy stands of these flowers are present throughout the entire CPSRA.

Small distinct colonies of native perennial bunch grasses grow in a few areas at HPS Phase II. Clusters of single species or a combination of species including purple needle grass (*Nassella pulchra*), blue wild rye (*Elymus glaucus*), and red fescue (*Festuca rubra*) grow sporadically throughout the Project site. These small isolated occurrences of native grasses are not large enough to warrant identification as a separate vegetation community.



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Portions of the Study Area, including uplands along Yosemite Slough, include ruderal vegetation such as fennel (*Foeniculum vulgare*) intermixed with non-native grasses such as wild oats and Italian rye (*Lolium multiflorum*). Shrubs, mainly coyote brush (*Baccharis pilularis*), are scattered throughout the upland surrounding Yosemite Slough area.

Landscaped Areas/Ornamental Plants

Landscaped areas make up about 44.67 acres of Candlestick Point and include areas landscaped with native and non-native ornamental shrubs and trees, particularly near the walking paths along the shoreline of Candlestick Point. A tree survey⁶⁵⁰ (provided in Appendix N4) was conducted for the Project within all of the Project site except the portion of CPSRA that is not subject to the land transfer and is not expected to be substantially modified. This survey identified trees primarily in areas mapped as “Landscaped/Ornamental”, “Urban”, and “Non-Native Annual Grassland” on Figure III.N-2. For the purpose of this survey, a “tree” was defined as any stem of a woody plant with a tree-like (as opposed to shrubby) growth habit measuring at least 2 inches in diameter at a height of 4.5 feet above the ground. As a result, single trees with multiple stems measuring at least 2 inches in diameter were represented as multiple “trees,” and the high number of trees recorded during this survey was driven largely by such multi-stemmed individuals. The tree survey recorded approximately 1,976 tree stems at least 2 inches in diameter on 1,068 individual plants on Candlestick Point and 854 tree stems at least 2 inches in diameter on 328 individual plants on HPS Phase II.

On Candlestick Point, the vast majority of these trees consisted of multi-stemmed lollypop trees (*Myoporum laetum*); eucalyptus (*Eucalyptus* spp.), pines (*Pinus* spp.), and olives (*Olea europaea*) were also well represented on Candlestick Point. All four of these species are non-natives. The most common native trees on Candlestick Point are California live oak (*Quercus agrifolia*), flannel bush (*Fremontodendron californicum*), and California buckeye (*Aesculus californica*). Monterey pine (*Pinus radiata*) and ornamental cypress (*Cupressus* spp.) are also common, although neither is native to San Francisco. There are several specimens of the native California bay (*Umbellularia californica*) and blue elderberry (*Sambucus nigra* ssp. *caerulea*) as well. Non-native, ornamental lollypop trees (*Myoporum laetum*) grow along the northwestern edge of Candlestick Point, and Australian tea trees (*Leptospermum laevigatum*) are scattered along the trails of the CPSRA. Native shrubs include coyote bush, ornamental buckbrush (*Ceanothus* spp.), firethorn (*Pyracantha* spp.), coffeeberry (*Rhamnus californica*), hummingbird sage (*Salvia spathacea*), and black sage (*S. mellifera*) which grow along the paths in clusters that are a combination of planted and volunteer specimens. Non-native evergreen shrubs such as rockrose (*Cistus* spp.) are common throughout the Project site and in some locations have naturalized.⁶⁵¹

On HPS Phase II, trees recorded during the tree survey were dominated by small, multi-stemmed toyon (*Heteromeles arbutifolia*; a native species, though the trees on HPS appear to be of an ornamental variety) and several non-natives, including London planetree (*Platanus x acerifolia*) and acacia (*Acacia* spp.).

⁶⁵⁰ H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.

⁶⁵¹ Naturalized plants are those that were originally installed as ornamental plantings but are now found growing ‘naturally’ in a variety of habitats.

Salt Marsh

Salt marsh habitat forms along the margins of estuaries and bays whose shorelines are shallow and protected. In the Study Area, it totals approximately 4.50 acres on site and 0.05 acre in areas of off-site (i.e., areas of Yosemite Slough outside of the Project boundary) Project work.⁶⁵² It occurs in limited areas along the shoreline where riprap does not extend to the waterline and prohibit the growth of vegetation, and in several nontidal areas in the southwestern portion of HPS. Narrow patches of salt marsh habitat, varying in length from 20 to 100 feet, occur sporadically along the shoreline of the Project site, and throughout Yosemite Slough.⁶⁵³

Salt marshes are often subject to tidal influences, and species composition of tidal salt marsh vegetation varies along gradients based on elevation. The amount of time an area is inundated determines the primary species of plants found there. The highest elevations typically support almost pure stands of pickleweed (*Salicornia virginica*), which also dominates the patches of nontidal salt marsh on HPS. Associated species that occur in the zone around the high tide elevation include salt grass (*Distichlis spicata*), European sea rocket (*Cakile maritima*), coastal gumweed (*Grindelia stricta*), and sea lavender (*Limonium californicum*). Slightly lower areas above the Mean High Water (MHW) elevation support cord grass (*Spartina* spp.). In the area above the HTL, common iceplant (*Carpobrotus edulis*) grows in some locations, carpeting the upland margins in a dense monoculture. The low growing shrub silver beach bur (*Ambrosia chamissonis*) also grows in the upland areas along the shoreline.

Seasonal Freshwater Wetland

Seasonal freshwater wetland habitat occupies 0.20 acre in two linear features at the southern and west-central margins of HPS Phase II. These wetlands are characterized by the presence of annual wetland grasses and forbs in depressions that hold water for a short to medium duration during the rainy season. One of these wetlands, in the southwestern portion of HPS Phase II, consists of pools that pools are shallow basins that lack drainage outlets. Seasonal water inundation in these pools creates a condition favoring hydrophytic (water-loving) plants such as spearscale (*Atriplex triangularis*), salt grass, bird's-foot trefoil (*Lotus corniculatus*), prickly ox-tongue (*Picris echioides*), saltmarsh bulrush (*Bolboschoenus robustus*), Italian ryegrass (*Lolium multiflorum*), rabbit's foot grass (*Polypogon monspeliensis*), and willow dock (*Rumex salicifolius*), as observed in HPS Phase II.⁶⁵⁴ The second seasonal freshwater wetland, in the west-central part of HPS Phase II, consists of a narrow swale/ditch that is apparently fed by groundwater seepage.

■ Common Aquatic Habitats

Mud Flats

Mud flats are the broad expanses of the San Francisco Bay bottom that are exposed during low tides. These areas are comprised of very soft sediments and do not support any vegetation other than eelgrass

⁶⁵² H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

⁶⁵³ H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

⁶⁵⁴ PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report*, Prepared for San Francisco Redevelopment Agency and San Francisco Planning Department, 2009, which is provided as Appendix N1 to this EIR.

beds, which may occur within mud flats. Mud flats are an important habitat because they support a vast array of crustaceans, worms, and other invertebrates that are important food sources for resident and migratory shorebirds and waterfowl. Mud flats are exposed at low tides once or twice a day along the shore south of CPSRA and along the shorelines of Yosemite Slough and South Basin. These mud flats are relatively limited in extent compared to the vast mud flats present in other parts of San Francisco Bay, and as a result, numbers of shorebirds using these mud flats are low except for occasional, brief migratory pulses of birds.

Open Water (San Francisco Bay)

San Francisco Bay (also referred to as “the Bay” in this section) is the largest estuary on the California Coast, covering between 400 and 1,600 square miles depending on which bays are included.⁶⁵⁵ Fresh water enters primarily through the Sacramento-San Joaquin Delta and mixes with seawater that enters via the Golden Gate. Tidal action and freshwater runoff determine the salinity of the Bay. For the purpose of this assessment, the term “open water” refers to unvegetated tidal areas located below the MHW elevation, which in this area is approximately 5.87 feet relative to the North American Vertical Datum of 1988 (NAVD88)⁶⁵⁶ or 11.80 relative to the San Francisco City Datum (SFCD).⁶⁵⁷ This is the same area regulated by the USACE under Section 10 of the *Rivers and Harbors Act*. These areas are subject to the normal ebb and flood of the tide. For example, mud flat habitats described above are a subset of open water aquatic habitats since these areas are inundated for at least half the tidal cycle; for this reason, acreages of mud flat and open water habitats are not distinguished in Table III.N-1. Open water habitats support an array of relatively common estuarine/marine species from encrusting tunicates, sponges, and algae to bottom-dwelling fish such as the Pacific halibut (*Hippoglossus stenolepis*), flounder, and sole, to more open water fish such as the Pacific herring (*Clupea pallasii*), Pacific sardine (*Sardinops sagax*), and anchovies (*Anchoa* spp.). The on-site open waters are those nearshore areas below the MHW elevation where Project work could occur (i.e., sea wall enhancements and marina improvements). Off-site open waters within a 5-mile radius of the Project site were also considered for their potential to support sensitive species (as described under “Sensitive Species and Habitats” below). These areas are considered here because most of the sensitive species potentially occurring there have the ability to move to and from the Study Area at any time.

Elgrass Beds

Elgrass is an aquatic plant found on soft mud-bottom bays and estuaries along the Pacific coast. It occurs in both subtidal and intertidal areas of San Francisco Bay and approximately 1.99 acres of it occur

⁶⁵⁵ The Bay Institute, *About the Bay*. 2008. Website: http://www.bay.org/about_the_bay.htm. Accessed October 28, 2008.

⁶⁵⁶ H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

⁶⁵⁷ San Francisco City Datum (SFCD) is a local vertical geodetic reference system specific to the City and County of San Francisco and formally established in 1964 as 8.616 feet above the National Geodetic Vertical Datum of 1929 (NGVD29), making it about 8.13 feet above mean sea level. The North American Vertical Datum was established in 1988 (NAVD88) and generally has replaced NGVD29 as a standard reference. Elevations expressed in NGVD29 may be converted to NAVD88 by adding 2.69 feet.

within the Study Area.⁶⁵⁸ Eelgrass beds are considered a sensitive resource and, therefore, are discussed in detail under Sensitive Species and Habitats.⁶⁵⁹

■ Common Wildlife

Invertebrates

Fourteen butterfly species were observed during the Yosemite Slough Watershed Wildlife Survey.⁶⁶⁰ Common butterflies observed during that survey included cabbage whites (*Pieris rapae*), anise swallowtails (*Papilio zelicaon*), and common checkered skippers (*Pyrgus communis*). Other butterflies observed include mustard white (*Pieris napi*), orange sulphur (*Colias eurytheme*), California hairstreak (*Satyrium californicum*), gray hairstreak (*Strymon melinus*), western pygmy-blue (*Brephidium exile*), spring azure (*Celastrina ladon*), west coast lady (*Vanessa annabella*), red admiral (*Vanessa atalanta*), common buckeye (*Junonia coenia*), and common ringlet (*Coenonympha tullia*), and monarch butterfly (*Danaus plexippus*). Numerous other invertebrate species, including insects, crustaceans, worms, and other taxa, occur on the site as well.

Reptiles and Amphibians

The Yosemite Slough Watershed Wildlife Survey recorded three snake species, two lizard species, and one amphibian.⁶⁶¹ Reptiles and amphibians observed included California slender salamander (*Batrachoseps attenuatus*), southern alligator lizard (*Elgaria multicarinata*), western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), ring-necked snake (*Diadophis punctatus*), and western garter snake (*Thamnophis elegans*). The western fence lizard, California slender salamander, and southern alligator lizard were found in relatively high numbers, with survey maxima (i.e., the maximum number of individuals observed on a single survey) of 49, 43, and 21 individuals, respectively. However, the other species were represented by few individuals, suggesting that populations of these other species are sparse in the area.

Amphibians had the lowest diversity within the Yosemite Slough Watershed Survey area, with only one species observed (the California slender salamander).⁶⁶² The California slender salamander frequents grassland, chaparral, woodland, forest, and yards and vacant lots in some suburban areas. It takes refuge under logs, boards, bark, and in damp leaf litter and rotting logs. It lays its eggs in late fall and winter, often in communal nests.⁶⁶³ The San Francisco Bay and the small seasonal wetlands on the site do not provide suitable aquatic habitat for amphibians, primarily due to high salinity. The few freshwater

⁶⁵⁸ California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database*, Wildlife and Habitat Data Analysis Branch, Sacramento, California, September 2003 edition.

⁶⁵⁹ California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database*, Wildlife and Habitat Data Analysis Branch, Sacramento, California, September 2003 edition.

⁶⁶⁰ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁶¹ Ibid.

⁶⁶² Ibid.

⁶⁶³ Stebbins, R., Peterson, *Field Guides: Western Reptiles and Amphibians*, Houghton Mifflin Company, 1966.

habitats on or near the Project site do not provide breeding habitat for amphibians such as frogs or toads, likely because of their very shallow and/or ephemeral nature.⁶⁶⁴

Reptiles also appeared to have relatively low diversity, with only five species observed. The abandoned fields, extensive debris (providing cover), and presence of prey (i.e., mice, invertebrates, salamanders) provide suitable habitat for these five species.⁶⁶⁵ The upland areas, dominated by disturbed vegetation and non-native grassland, support the snake and lizard species.⁶⁶⁶

During one survey, 21 southern alligator lizards were observed in silvery beachweed along the shoreline of the South Basin (refer to Map 2 of the Yosemite Slough Watershed Wildlife Survey for a graphic representation of the location of the South Basin).⁶⁶⁷ The lizards were all juveniles and may have been from a single clutch that had been laid in the silvery beachweed.⁶⁶⁸

Although the Yosemite Slough Watershed Wildlife Survey covered only Candlestick Point and the southern shoreline of HPS Phase II, it is expected that a lower abundance of these common reptile and amphibian species would be found within the disturbed areas within HPS Phase II than at Candlestick Point. Recent, intensive disturbance due to ongoing remediation activities has undoubtedly reduced populations of these species on HPS Phase II. A few individuals of these reptiles and amphibians may occur within the developed portions of the Project site, which represents approximately 80 percent of the overall acreage of the site, but numbers are expected to be very low in such low-quality habitat.

Birds

One hundred and eighteen bird species (which are named herein according to the American Ornithologists' Union Checklist of North American Birds⁶⁶⁹ except for sensitive subspecies recognized by CDFG or USFWS) were observed during the Yosemite Slough Watershed Wildlife Survey.⁶⁷⁰ Of these, 51 species were represented by a maximum count of five or fewer individuals, indicating that, for many bird species, the site is used by relatively low numbers of individuals.⁶⁷¹ The majority of the species observed were terrestrial species, followed by shorebirds, waterfowl, gulls and terns, and raptors (in descending order). Terrestrial habitats supported large numbers of some common bird species such as white-crowned sparrows (*Zonotrichia leucophrys*), western meadowlarks (*Sturnella neglecta*), and house finches (*Carpodacus mexicanus*). The landbirds that are most abundant on the site are those associated with the weedy, ruderal habitats dominating the Project site and those tolerant of the urbanization and associated disturbance resulting from the site's location. In contrast, very few Neotropical and other long-distance migrant songbirds were recorded during this study. Studies have documented that bird species diversity is closely associated with structural habitat complexity. Bird species diversity (a measure of the number of

⁶⁶⁴ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁶⁵ Ibid.

⁶⁶⁶ Ibid.

⁶⁶⁷ Ibid.

⁶⁶⁸ Ibid.

⁶⁶⁹ American Ornithologists' Union (AOU), *Check-list of North American Birds (1998)* through Forty-ninth Supplement, July 2008.

⁶⁷⁰ Ibid.

⁶⁷¹ Ibid.

species in a given area) increases with increasing foliage height diversity (a measure of the number and diversity of vertical layers of vegetation in that area).^{672,673} While this has been best studied in breeding birds, the structural complexity of habitat also influences the degree to which an area provides resources to migrant birds. Multi-layered vegetation, with well-developed ground, understory, and canopy layers, would support greater diversity of migrants than the structurally simple vegetation that dominates most of Candlestick Point and HPS Phase II. Also, breeding bird abundance is often closely associated with the density or volume of vegetation, with increasingly dense vegetation supporting more individual birds⁶⁷⁴. The sparse vegetation present on most of the Project site limits the value of the site to breeding and migratory birds. Numbers and diversity of landbirds on HPS Phase II are likely lower than on Candlestick Point owing to the recent, intensive disturbance and even lower abundance of trees and shrubs on HPS Phase II.

The waters of the South Basin and the Bay surrounding the Study Area are used by a variety of waterbirds, some of which are fairly abundant. Common waterbirds observed in these waters include double-crested cormorant (*Phalacrocorax auritus*), California gull (*Larus californicus*), greater scaup (*Aythya affinis*), ruddy duck (*Oxyura jamaicensis*), surf scoter (*Melanitta perspicillata*), and bufflehead (*Bucephala albeola*). While these birds forage primarily or solely in aquatic habitats, some species, such as cormorants, California brown pelicans (*Pelecanus occidentalis californicus*), gulls, and possibly terns roost in large numbers on piers on HPS Phase II. Small numbers (fewer than 10 pairs) of western gulls (*Larus occidentalis*) nest on two rocks in South Basin known as Double Rock. Shorebirds such as the western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), and dunlin (*Calidris alpina*) forage on intertidal mud flats and along the shoreline of Candlestick Point and the southern part of HPS Phase II, typically in low numbers but occasionally in higher numbers when migratory pulses of shorebirds are present in the Bay. The majority of the Study Area is developed or urbanized and supports relatively few species of birds.

In addition to the 118 bird species recorded during the Yosemite Slough Watershed Wildlife Survey, that survey's report listed an additional 36 species that had been recorded by a local birder, Mr. Alan Hopkins, over the past 20 years.⁶⁷⁵

Mammals

The most abundant mammal observed during the Yosemite Slough Watershed Wildlife Survey was the California ground squirrel (*Spermophilus beecheyi*). This species was observed along the shoreline and riprap areas of HPS Phase II and Candlestick Point, as well as in grassland and ruderal habitats and under trees and shrubs on Candlestick Point. The substrate along the shoreline is composed mostly of small rubble such as broken bricks that had been used as fill. Riprap composed of large rocks was placed along exposed sections of the shoreline, providing refugia for small mammals.⁶⁷⁶ Other mammals observed during the survey included feral domestic cat (*Felis silvestris*), feral domestic dog (*Canis familiaris*), raccoon

⁶⁷² MacArthur, R. H. and J. W. MacArthur. 1961. On bird species diversity. Ecology 42:594-598.

⁶⁷³ Karr, J. R. 1968. Habitat and avian diversity on strip-mined land in east-central Illinois. Condor 70:348-357.

⁶⁷⁴ Mills, G. S., J. B. Dunning, Jr., and J. M. Bates. 1991. The relationship between breeding bird density and vegetation volume. Wilson Bulletin 103:468-479.

⁶⁷⁵ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁷⁶ Ibid.

(*Procyon lotor*), striped skunk (*Mephitis mephitis*), harbor seal (*Phoca vitulina*), black-tailed jackrabbit (*Lepus californicus*), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), and Norway rat (*Rattus norvegicus*). Of the 10 species recorded by the LSA study, three are non-natives (domestic dog, domestic cat, and Norway rat); two are common urban-adapted species (raccoon and striped skunk); and one occurs infrequently in aquatic areas (harbor seal). Of the remaining four species, the Botta's pocket gopher and California vole were represented by no more than one individual on a given survey and thus may be uncommon on the site. As mentioned for reptiles and amphibians above, mammal diversity and abundance on HPS Phase II are expected to be lower than on Candlestick Point, as recent, intensive disturbance by remediation activities has likely reduced mammal populations there. The shorelines, vacant lots, and undeveloped ruderal/non-native grassland areas of HPS Phase II and CPSRA are surrounded by urban and industrial development, which limits the potential for dispersal of mammals in and out of the site. There are no CNDDDB reports of the occurrence of any special-status mammal species in the Study Area.

■ Common Aquatic Resources

Fish, Crabs, and Mollusks

San Francisco Bay supports a diverse assemblage of fish species. These vary from resident fish such as assorted flat fish (flounder and sole) to a variety of rockfish (*Sebastes* spp.) and to migratory species such as Pacific herring, Pacific sardines, anchovies, and salmonids (*Oncorhynchus* spp.) which spend varying portions of their life cycle in the Bay. Estuaries provide important spawning habitat for fish and the San Francisco Bay is no exception. Pacific herring spawn in the Bay and support a small commercial fishery. Other fish for which adults spawn in the Bay include flounder, sole, and Pacific halibut. Juvenile sturgeon (*Acipenser* spp.) rear in the Bay for an undetermined length of time before moving to the ocean.

Shellfish found in the Bay and within the vicinity of the Study Area include Dungeness crab (*Cancer magister*), other rock crab, and shrimp. Dungeness are the target of an important commercial fishery in the open ocean and the Bay is important rearing habitat for young crab. Crab hatch in the Gulf of the Farallones and after several larval stages, migrate into the Bay and rear primarily in San Pablo and Suisun bays,⁶⁷⁷ over 20 miles north of the Study Area.

The Bay also supports a variety of mollusks. These include native clams, mussels, oysters, and snails (gastropods). Some of these are native (i.e., bent-nosed macoma [*Macoma nasuta*], Olympia oyster [*Ostrea conchaphila*], and limpets [*Acmaea* spp.]) while others have been introduced either intentionally such as the Atlantic oyster (*Crassostrea virginica*) or unintentionally such as overbite clam (a.k.a. Asian clam; *Corbula amurensis*). Many of the clams use soft-bottom sediments and could be found on the seafloor near the Project site. Most oysters require a solid substrate for attachment. Suitable habitat for oysters and mussels is found throughout the Study Area on bulkheads, pilings, and riprap associated with the shoreline.

In addition to the native fish and shellfish, the Bay supports a vast array of introduced species. Most of these have been introduced in ballast water of trans-Pacific traveling cargo ships. Species suspected of

⁶⁷⁷ California Department of Fish and Game (CDFG), 2009. Dungeness crabs (*Cancer magister*). Website: <http://www.delta.dfg.ca.gov/baydelta/monitoring/cmag.asp>. Accessed July 16, 2009.

being ballast water introductions include Chinese mitten crab (*Eriocheir sinensis*), yellowfin goby (*Acanthogobius flavimanus*), and overbite clam. Other species, including striped bass (*Morone saxatilis*) and American shad (*Alosa sapidissima*), have been introduced to support sport fisheries. The complex interaction between introduced and native species within the Bay continues to be the topic of much debate and study.

The open water of the Study Area is part of or directly connected to the Bay and all of the Bay fish species can move freely into and out of the Study Area at any time. Because of this, the species assemblage within and adjacent to the Project site is expected to be representative of the central Bay as a whole.

The portion of the San Francisco Bay immediately adjacent to the Project site has been highly modified over the years to support commercial shipping, industrial uses, and US Naval activities, and virtually the entire shoreline of the Study Area is composed of fill of various kinds. As a result, the shorelines are almost exclusively comprised of bulkheads and riprap. Dredging of shipping channels has occurred within the nearshore areas. All of these actions have combined to reduce the aquatic habitat complexity. Reductions in habitat complexity reduce the number of species that routinely utilize a particular area,⁶⁷⁸ and, therefore, the numbers of resident fish species within the Study Area are expected to be similar to other developed areas of the Bay.

Marine Mammals

The most common marine mammals within San Francisco Bay are harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*), both of which are protected under the *Marine Mammal Protection Act*. The *Marine Mammal Protection Act* does not bestow a particular status designation for the species it protects, which is similar to the *Migratory Bird Treaty Act*. Instead, the *Marine Mammal Protection Act* and the *Migratory Bird Treaty Act* equally protect all marine mammals and native birds, respectively.

Harbor Seal (*Phoca vitulina*)

Harbor seals are year-round residents found throughout the Bay. They use haulouts scattered through the Bay to bask, rest, and use as pupping sites. The most frequently used pupping sites are in the North (Castro Rocks) and South bays (Mowry Slough); both sites are over 15 miles from the Study Area. Pupping season begins in late March and peaks in early May.⁶⁷⁹ The closest haulout site is on Yerba Buena Island, about 6 miles from the Project site.⁶⁸⁰ There are no known haulout locations within the Study Area. During the 2003–2004 Yosemite Slough Watershed Wildlife Survey, LSA observed nine harbor seals in the outer South Basin (open water between Candlestick Point and HPS Phase II); however, no haulouts were detected during the survey.⁶⁸¹ No harbor seals or haulouts were observed during surveys by PBS&J biologists for this Project.

⁶⁷⁸ Moyle, P.B. *Inland Fishes of California*, 2nd Edition, University of California Press.

⁶⁷⁹ Richmond Bay Bridge Harbor Seal Team. No date. Harbor Seal. Website: <http://userwww.sfsu.edu/~halmark/educati.htm>. Accessed October 31, 2008.

⁶⁸⁰ San Francisco State University. No date. *Richmond Bridge Harbor Seal Survey Site Map*. Website: <http://userwww.sfsu.edu/~halmark/map.htm>. Accessed October 31, 2008.

⁶⁸¹ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

California Sea Lion (*Zalophus californianus*)

California sea lions do not breed in the Bay, preferring offshore islands such as the Channel Islands near Santa Barbara or the Farallon Islands, but sea lions forage and rest at various locations around the San Francisco Peninsula.⁶⁸² They are relatively social animals, frequently seen basking or foraging in large groups. On May 2, 2003, a total of ten sea lions were observed hauled out on a flat, floating structure in the outer South Basin.⁶⁸³ Sea lions may occur in the Study Area, but the site does not support any known haulout locations.

■ Sensitive Species and Habitats

The potential for special-status plant and wildlife species to occur within the Study Area was determined by assessing habitat suitability information collected during biological reconnaissance surveys conducted in August 2007 and July 2008, a rare plant survey conducted in May 2008, and a review of the CNDDB, CNPS Inventories, and USFWS databases, as previously described. In addition, approximately 29 wildlife surveys were conducted in the vicinity of Yosemite Slough between January 2003 and April 2004 (in association with the Yosemite Slough Watershed Wildlife Survey), and that survey's report included a list of additional bird species that had been observed by Mr. Alan Hopkins over the past 20 years.⁶⁸⁴ The list of potentially occurring special-status species provided in Table III.N-5 (Special-Status Species Potentially Occurring within the Study Area) is informed by all of these sources, as well as a search of known sensitive species occurrences within a 5-mile radius of the Project site, as shown in Figure 3 (Special-Status Species Occurrences within 5-Mile Radius) in Appendix N1 to this EIR. (*Note: Table III.N-5 is provided at the end of this section due to its length.*)

Special-status species are defined as follows:

- Species listed, proposed, or candidate for listing as Threatened or Endangered by the USFWS pursuant to the federal *Endangered Species Act of 1973* (FESA), as amended
- Species designated by the USFWS as Species of Conservation Concern
- Species designated by the National Marine Fisheries Service (NMFS) as Species of Special Concern
- Species listed as Rare, Threatened, or Endangered by the CDFG pursuant to the *California Endangered Species Act of 1984* (CESA), as amended
- Species designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians) of the *California Fish and Game Code*
- Species designated by the CDFG as California Species of Special Concern
- Plant species listed as Category 1B and 2 by the CNPS; CNPS Category 3 and 4 species were not considered special-status species for the sake of this assessment, as they are not considered sufficiently rare on a regional level to warrant such status, though no such plants were recorded in the Study Area.

⁶⁸² Marine Mammal Center 2002. *California Sea Lion information sheet*. Website:

<http://www.marinemammalcenter.org/learning/education/pinnipeds/casealion.asp>. Accessed October 31, 2008.

⁶⁸³ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

⁶⁸⁴ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

- Species not currently protected by statute or regulation, but considered rare, threatened or endangered under Section 15380 of the CEQA Guidelines (such as the Olympia oyster and Pacific herring)

Table III.N-5 identifies the special-status plant and wildlife species that have been recorded or could occur within five miles of the Study Area, along with a description of their habitat requirements, protection status, and a brief description of each species' likelihood to be present within the Study Area. Several species known to occur within five miles of the Study Area and listed in Table III.N-5 were determined not likely to occur or to be absent from the Study Area because (1) the site lacks suitable habitat or is outside of the species' range and, (2) no instances of such species were observed during any of the field surveys (these species are further discussed in the *Bayview Waterfront Project Biological Technical Report*, which is provided as Appendix N1 to this EIR⁶⁸⁵). Consequently, the detailed species' discussions and impact analysis in this EIR section address only those species in Table III.N-5 that have a "Low" or better probability to occur within the Study Area. Those species or habitats with a "Not Likely" or "Absent" likelihood of occurrence in Table III.N-5 are not addressed further because they are not expected to occur on the Study Area or be affected by Project implementation.

Sensitive Plants

The USFWS, CNDDDB, and CNPS reported 41 special-status plant species as potentially occurring within the US Geological Survey's 7.5-minute San Francisco South and Hunters Point quadrangles (refer to Table 2 [Special-Status Species Potentially Occurring within the Vicinity of the Bayview Waterfront Project] in Appendix N1 to this EIR).

The Study Area is largely developed and most vegetation in the area was introduced as landscape plants and turf grass. Much of the Study Area, including virtually all of CPSRA, is located on Bay fill. Ruderal (disturbed) habitats and ornamental landscaping predominate in those portions that are not landscaped. Jones & Stokes conducted botanical habitat assessments of the Candlestick Point and HPS on October 29, 2004; March 1, 2006; October 6, 2006; and May 17, 2007.⁶⁸⁶ PBS&J botanists conducted rare plant surveys for the Candlestick Point area in May 2008. The general absence of suitable habitat over a majority of the Study Area in conjunction with the absence of observed special-status plants, either as observed during focused surveys or cited in CNDDDB species accounts, supports the conclusion that no sensitive plant species occur within the Study Area.

Sensitive Vegetation Communities and Habitats

Waters of the United States and Navigable Waters

The Study Area contains several categories of jurisdictional waters of the United States, including jurisdictional wetlands that are subject to Section 404 of the *Clean Water Act* (Section 404). The types of wetlands include salt marsh and seasonal freshwater wetlands. In addition, the Study Area also contains open waters of the San Francisco Bay, which are subject to both Section 404 of the *Clean Water Act* and Section 10 of the *Rivers and Harbors Act of 1899* (Section 10). Section 404 regulates the placement of fill

⁶⁸⁵ PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report*, prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009.

⁶⁸⁶ Jones and Stokes, *Natural Environmental Study Report for the Bayview Transportation Improvements Project*, June 2009.

into any “waters of the United States.” Waters of the United States are broadly defined to include navigable waterways, their tributaries, lakes, ponds, and wetlands, including tidal waters and wetlands from the HTL seaward. Section 10 regulates the placement of fill into navigable waters of the United States, including tidal waters from the MHW elevation seaward. Section 10 waters are a subset of Section 404 waters, and are therefore not described separately for purposes of this EIR. A more detailed discussion of the requirements of Section 404 and Section 10 is provided in Section III.N.3 (Regulatory Framework).

A wetland delineation was conducted by H.T. Harvey & Associates for the Study Area that distinguished jurisdictional wetlands and other waters of the United States subject to Section 404.⁶⁸⁷ The revised H.T. Harvey & Associates wetland delineation was submitted to the USACE in July 2009 and was verified in August 2009. The study area for that delineation included the Project site and the off-site areas where Project activities would occur (Figure III.N-3 [Wetlands and Other Waters]). As indicated on Figure III.N-3, the study area for H.T. Harvey’s original wetland delineation did not include several limited areas that are now considered part of the Project site. As a result, H.T. Harvey expanded its original delineation by inspecting these additional areas in the field on October 8, 2009. H.T. Harvey & Associates has amended its wetland delineation report, and verification of jurisdictional boundaries in these additional areas by the USACE is pending.

According to USACE regulations and guidance, other waters may include lakes, seasonal ponds, channels, tributary waters, non-wetland linear drainages, and seasonal springs. Such areas are identified by the (seasonal or perennial) presence of standing or running water and generally lack hydrophytic vegetation.

In tidal waters, Section 404 other waters extend to the landward extent of vegetation associated with salt or brackish water or the HTL. The HTL is defined as the line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The HTL may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gauges, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. Confirmation of this definition and approach used by the San Francisco District of the USACE in determining the MHW and HTL locations was obtained from the Regulatory Branch of the USACE on January 29, 2009.⁶⁸⁸ The HTL represents the upper limit of Section 404 other waters and is approximately 1.5 to 2 vertical feet above the MHW mark.⁶⁸⁹

⁶⁸⁷ H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

⁶⁸⁸ Ibid.

⁶⁸⁹ Ibid.



SOURCE: HT Harvey, 2009; Moffat & Nichol, 2009; PBS&J, 2009.

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FIGURE III.N-3



Candlestick Point — Hunters Point Shipyard Phase II EIR
WETLANDS AND OTHER WATERS

Table III.N-2 (Wetlands and Other Waters of the United States [Section 404] within the Study Area) presents the acreage of waters of the United States (including jurisdictional wetlands) that were delineated for the Study Area. The acreages of jurisdictional wetlands and waters identified in Table III.N-2 include the HT Harvey study area boundary as identified in Figure III.N-3 (which includes open waters adjacent to Candlestick Point and HPS Phase II), as well as off-site areas of Yosemite Slough that are located outside of this boundary.

Table III.N-2 Wetlands and Other Waters of the United States (Section 404) within the Study Area					
<i>Jurisdictional Feature (Waters of the United States)</i>	<i>Area</i>		<i>Yosemite Slough</i>		<i>Total Acreage</i>
	<i>Candlestick Point</i>	<i>Hunters Point Shipyard</i>	<i>On Site</i>	<i>Off Site</i>	
Freshwater Wetland	—	0.20	—	—	0.20
Non-tidal Salt Marsh	—	1.81	—	—	1.81
Tidal Salt Marsh	0.93	1.75	0.01	0.05	2.74
"Other 404 Waters"	21.82	169.29	1.66	2.77	195.54
Totals for Section 404 Wetlands and Waters of the US	22.75	173.05	1.67	2.82	200.29

SOURCE: H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters*, San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

a. Total equals sum of Freshwater Wetland, Non-tidal Salt Marsh, Tidal Salt Marsh, and Other 404 Waters

b. On-site areas within Yosemite Slough refer to areas within the Study Area. Off-site areas within Yosemite Slough are those areas adjacent to the slough that are outside of the Study Area boundary.

Eelgrass Beds

Eelgrass occurs in both subtidal and intertidal areas of San Francisco Bay. The distribution of eelgrass has been mapped relatively recently (in 2003) and the results of this effort indicate that low-density eelgrass beds are found on the north side of Hunters Point peninsula offshore from the end of Earl Street and in a small patch in the South Basin.⁶⁹⁰ Eelgrass beds form areas of important habitat for birds, fish, and crustaceans and are one of the preferred spawning habitats of Pacific herring.⁶⁹¹ These plants also support grazing crustaceans, shrimp, and amphipods. Because it requires light for photosynthesis, eelgrass is limited by water clarity to depths of about 6 feet or less. Because little accurate information exists about the historic distribution of eelgrass beds, and because of their current relative scarcity and importance in the overall ecology of the Bay, both the USACE and CDFG consider eelgrass beds a sensitive resource.

⁶⁹⁰ San Francisco Bay Eelgrass Inventory, June-October 2003. Prepared for Caltrans and NOAA Fisheries. Prepared by Merkel and Associates, 2003.

⁶⁹¹ Wyllie-Echeverria, S. and M. Fonseca. Eelgrass (*Zostera marina*) research in San Francisco Bay, California from 1920 to the Present. 2003.

Sensitive Wildlife

Invertebrates

Monarch Butterfly (*Danaus plexippus*)

Monarch butterflies are common and widespread in California, including the San Francisco Bay area. However, because they tend to gather in winter roosting sites along the California coast in relatively few locations, roost sites that used traditionally by large numbers of individuals are considered sensitive biological resources and, thus, this common butterfly is discussed here as a sensitive species. Wintering sites in California are associated with wind-protected groves of large trees (primarily eucalyptus or pine) with nectar and water sources nearby, generally near the coast.

A total of seven monarch butterflies were observed during the Yosemite Slough Watershed Wildlife Survey.⁶⁹² Ms. Mia Monroe, a Ranger with the Muir Woods National Monument (US National Parks Service) and co-coordinator of the Monarch Campaign for the past 15 years, was contacted in July 2008 and July 2009 to inquire about any known monarch wintering roosts that occur in the Project site. Ms. Monroe consulted with local monarch butterfly specialists and the Monarch Campaign Thanksgiving counts. The Monarch Campaign conducts surveys for peak monarch butterfly wintering population around the Thanksgiving holiday. Ms. Monroe reported there are no records of monarch butterfly autumnal (i.e., temporary bivouac site) nor over-wintering use of the Project site in the CNDDB or reported in other records, including anecdotal observations. The nearest observations of monarch butterfly roosts are at Fort Mason, the Presidio of San Francisco, and Stern Grove.⁶⁹³

Using the likelihood of occurrence definitions provided in Table III.N-5, although individual monarch butterflies were observed, the sensitive winter roosting habitat is “not likely” to occur within the Study Area.

Birds

While the CNDDB reports no occurrences of any special-status bird species in the Study Area, special-status bird species have been recorded in the Study Area during the Yosemite Slough Watershed Wildlife Survey and by Alan Hopkins, as documented in that survey’s report. Special-status bird species with potential to occur on the site are described below and are also summarized in Table III.N-5. Although the harlequin duck (*Histrionicus histrionicus*), Barrow’s goldeneye (*Bucephala islandica*), common loon (*Gavia immer*), yellow warbler (*Dendroica petechia*) and Vaux’s swift (*Chaetua vauxi*) have all been observed within the site, these species are considered California Species of Special Concern only when breeding.⁶⁹⁴ As they only occur within the site as non-breeders, none of them are discussed below, as they would be present only when they would not be considered Species of Concern.

⁶⁹² Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁹³ Monroe, M., Ranger, Muir Woods National Monument, telephone conversation with Todd Wong, PBS&J, July 16, 2008 and July 20, 2009.

⁶⁹⁴ California Department of Fish and Game (CDFG). Electronic file: <http://www.dfg.ca.gov/wildlife/nongame/ssc/birds.html>, accessed on July 30, 2009.

Alameda Song Sparrow (Melospiza melodia pusillula)

The Alameda song sparrow is a CDFG Species of Special Concern. The Alameda song sparrow occurs only in the marshlands of the southern San Francisco Bay Region.⁶⁹⁵ The primary range of the Alameda song sparrow extends from Coyote Creek, at the southern extremity of the Bay, northward along the west shore of South San Francisco Bay to Belmont Slough (south of the Study Area) and along the east shore to San Lorenzo. Song sparrows nest in dense riparian thickets, emergent wetlands (including salt marshes), and dense thickets of other vegetation.⁶⁹⁶ The Alameda song sparrow uses tidal salt marsh habitats along the edge of the Bay and streams where tidal flow affects the vegetation. Candlestick Point and HPS Phase II provide potential habitat for this species in salt marshes along the shoreline, but due to the very narrow nature of tidal salt marsh in the Study Area, such habitat is marginal at best for this species. Song sparrows were observed between January 2003 and April 2004 along Yosemite Slough, but the observed sparrows may or may not be Alameda song sparrows.⁶⁹⁷ Observations in April may be of breeding birds although nesting has not been documented. Given the marginal quality of habitat on the site, the site's isolation from more extensive marshes that may serve as source populations for Alameda song sparrows, and the sedentary nature of Alameda song sparrows, it is possible that these are the more widespread race *gouldii* or that they represent migrants or wintering individuals from other races that occur in the region during the non-breeding season. The CNDDB does not report occurrences of Alameda song sparrow in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “low” likelihood to occur within the Study Area.

American Peregrine Falcon (Falco peregrinus anatum)

The American peregrine falcon is a state-listed endangered species and a CDFG fully protected species pursuant to Section 3511 of the *California Fish and Game Code*; however, the California Fish and Game Commission voted to remove the species from the state endangered species list on August 6, 2009. The bird has experienced a remarkable resurgence in California and other parts of North America. This striking recovery is due in large measure to the ban on the use of DDT in many places. The peregrine has recovered in North America to the point that the USFWS removed the species from the federal Endangered Species List on August 25, 1999.⁶⁹⁸ A pair of American peregrine falcons has nested in the Re-gunning crane on Parcel D of the Shipyard, and has raised several broods at this location over the years.⁶⁹⁹ These birds forage widely over the entire Study Area, likely feeding primarily on rock pigeons (*Columba livia*) and waterbirds.

⁶⁹⁵ Walton, B., 1974. *Salt Marsh Song Sparrow Study*. California Department of Fish and Game (CDFG), 1974. Available at: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=4696>. Accessed July 21, 2008.

⁶⁹⁶ Madrone Audubon Society, *Sonoma County Breeding Bird Atlas*, 1995.

⁶⁹⁷ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁶⁹⁸ United States Fish and Wildlife Service (USFWS), *Endangered and Threatened Wildlife and Plants; Final Rule To Remove the American Peregrine Falcon From the Federal List of Endangered and Threatened Wildlife, and To Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Conterminous United States*; Final Rule, 64 Federal Register 46542, August 1999.

⁶⁹⁹ Nelson, G., Facility Coordinator, Department of the Navy, field visit with PBS&J, July 8, 2008.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area.

Bryant's Savannah Sparrow (Passerculus sandwichensis alaudinus)

Bryant's savannah sparrow is a CDFG Species of Special Concern. Bryant's savannah sparrow is a California endemic restricted to a narrow coastal strip from Humboldt Bay south to the Morro Bay; its center of abundance appears to be the San Francisco Bay area.⁷⁰⁰ This sparrow occupies low tidally influenced habitats, adjacent ruderal areas, moist grassland within and just above the fog belt, and infrequently, drier grasslands. Adjacent to salt marshes this sparrow also occupies weedy spoil areas, canal banks, and bottomland pastures. In South San Francisco Bay, it nests mainly on levee tops grown to grasses and in areas of high pickleweed on levee banks. Bare ground, whether provided by tidal mud flats or upland interstitial areas between clumps of vegetation, appears to be an important component of occupied habitat. The Study Area provides potential habitat for this species in salt marshes along the shoreline, but because of the very narrow nature of tidal salt marsh in the Study Area only marginal quality habitat is available. Savannah sparrows were observed between January 2003 and April 2004 along Yosemite Slough, although the observed sparrows may or may not be Bryant's savannah sparrows.⁷⁰¹ Observations in April 2004 may be of breeding birds although nesting has not been documented. Given the marginal quality of habitat on the site and the site's isolation from more extensive marshes that may serve as source populations for savannah sparrows, it is possible that these represent migrants or wintering individuals from other races that occur in the region during the non-breeding season. The CNDDB does not report occurrences of the Bryant's savannah sparrow bird in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “low” likelihood to occur within the Study Area.

Burrowing Owl (Athene cunicularia)

Burrowing owl, a CDFG Species of Special Concern, is an owl that dwells in generally flat, open, dry grasslands, pastures, deserts, and shrub lands, and in grass, forbs and open-shrub stages of pinyon-juniper and ponderosa pine habitats. Burrowing owls use communal ground squirrel and other small mammal burrows for nesting and cover, as well as artificial structures such as roadside embankments, levees, and berms. They can exhibit high site fidelity, often reusing burrows year after year. Occupancy of suitable burrowing owl habitat by breeding birds can be verified at a site by observation of a pair of burrowing owls during their breeding season (March to August) or, alternatively, by the presence of molted feathers, cast pellets, prey remains (rodents, small reptiles, and large insects), eggshell fragments, or whitewash (guano), at or near a burrow. Burrowing owls are fairly tolerant of human activity near their nest burrows as long as suitable foraging habitat exists nearby. Owl populations have declined sharply in some portions of California during the past two decades (i.e., the San Francisco Bay Area, Sacramento County, San Joaquin County, etc.), but they have increased greatly in some agricultural counties (particularly Imperial). Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect

⁷⁰⁰ California Department of Fish and Game (CDFG). *California Birds Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. 2008.

⁷⁰¹ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

breeding evidence by this species anywhere in the City.⁷⁰² The CNDDDB does not report occurrences of this species in the area, but burrowing owls have been recorded previously on the site. Historically, they occurred in a rubble pile in the northeastern corner of Candlestick Point, and there have been sporadic sightings of the species in various locations on HPS as well. Breeding is not known to have occurred in the Study Area, and these individuals may all have been migrants and wintering individuals.⁷⁰³ The frequency of occurrence has apparently declined in recent years, and although suitable breeding, roosting, and foraging habitat is present within the Study Area, the species does not currently breed here and occurs sporadically and in low numbers, at best.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area.

California Brown Pelican (Pelecanus occidentalis californicus)

The California brown pelican is on the verge of recovery. It has been proposed for delisting by the Fish and Game Commission⁷⁰⁴ and also recently proposed for delisting under the FESA.⁷⁰⁵ It is fully protected by CDFG under Section 3511 of the *California Fish and Game Code*. The California brown pelican is found in estuarine, marine sub-tidal, and marine pelagic (deep) waters along the California coast. Pelicans nest from the Channel Islands of Southern California southward along the Baja California coast and in the Gulf of California to coastal southern Mexico.⁷⁰⁶ The pelican builds nests of sticks on the ground, typically on islands or offshore rocks. Post-breeding adults and immature birds are found along the Pacific Coast from Oregon south into Baja, Mexico. This species has been observed perching on piers within HPS Phase II, particularly the three piers in the southeastern corner of HPS Phase II, and it forages within San Francisco Bay; however, the species has never nested as far north as the Bay and nesting habitat for this species is not present in the Study Area. In addition, CNDDDB does not report occurrences of California brown pelican communal roosts in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area.

Loggerhead Shrike (Lanius ludovicianus)

The loggerhead shrike, a CDFG Species of Special Concern, is a common resident and winter visitor in lowlands and foothills throughout California and prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. It occurs only rarely in heavily urbanized areas, but is often found in open cropland. The *San Francisco Breeding Bird Atlas*, for which field work was conducted in 1991-1993, reported a record

⁷⁰² San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

⁷⁰³ Personal Communication between Alan Hopkins to Steve Rottenborn, July 10, 2009.

⁷⁰⁴ California Department of Fish and Game (CDFG) news release: *Fish and Game Commission votes to remove California brown pelican from State Endangered Species List*. February 17, 2009.

⁷⁰⁵ United States Fish and Wildlife Service (USFWS), *Endangered and Threatened Wildlife and Plants; Species Account: California Brown Pelican (Pelecanus occidentalis californicus)*; Classification: Proposed for delisting; Federal Register 73:9407; February 20, 2008.

⁷⁰⁶ California Department of Fish and Game (CDFG) B043, *Brown Pelican*. Website: <http://www.dfg.ca.gov/whdab/html/B043.html>. Accessed April 19, 2005.

of possible breeding in the atlas block that included HPS and referred to a historical breeding record in the atlas block that includes Candlestick Point.⁷⁰⁷ Low numbers of loggerhead shrikes have been observed on Candlestick Point and HPS by Alan Hopkins, and non-native grasslands provide suitable foraging habitat and on-site trees provide suitable nesting habitat for this species. However, there is no evidence of confirmed breeding in recent years, and the species currently occurs as an uncommon migrant and winter resident.⁷⁰⁸

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

Northern Harrier (Circus cyaneus)

The northern harrier, a CDFG Species of Special Concern, prefers coastal prairies, marshes, grasslands, swamps and other open areas. Although this species primarily eats small rodents (mice and voles), amphibians, small reptiles, small rabbits, and other birds, northern harriers will eat some invertebrates as well. Northern harriers usually return to the same area to nest in consecutive years. They nest on the ground in well-concealed locations, often near low shrubs or in tall clumps of vegetation. Nesting locations are usually in abandoned fields, wet meadows, and coastal and inland marshes. Wetlands and non-native grasslands provide suitable foraging habitat for small numbers of this species on the site, and northern harriers have been observed by Alan Hopkins in the Study Area.⁷⁰⁹ However, due to the extent of disturbance by humans and pets, the lack of extensive wetlands suitable for nesting, and the vulnerability of ground-nesting birds to predation in upland portions of the Study Area, harriers are not expected to nest there. Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the City.⁷¹⁰

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

San Francisco Common Yellowthroat (Geothlypis trichas sinuosa)

The San Francisco common yellowthroat is a California Species of Concern and is one of four subspecies of common yellowthroat that breed in California. The breeding range of the San Francisco common yellowthroat as described by Foster is bounded by Tomales Bay on the north, Carquinez Strait on the east, and Santa Cruz County on the south, which would include the Study Area.⁷¹¹ Yellowthroats are found in freshwater marshes, coastal swales, swampy riparian thickets, brackish marshes, salt

⁷⁰⁷ San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

⁷⁰⁸ Personal Communication between from Alan Hopkins to Steve Rottenborn, July 10, 2009.

⁷⁰⁹ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁷¹⁰ San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

⁷¹¹ Foster, M. L., *Status of the salt marsh common yellowthroat (Geothlypis trichas sinuosa) in the San Francisco Bay Area, California 1975–1976*, California Department of Fish and Game (CDFG), 1977.

marshes, and the edges of disturbed weed fields and grasslands that border soggy habitats.⁷¹² In the San Francisco Bay region as a whole, about 60 percent of yellowthroats breed in brackish marsh, 20 percent in riparian woodland/swamp, 10 percent in freshwater marsh, 5 percent in salt marsh, and 5 percent in upland vegetation.⁷¹³ The brackish marsh in the Study Area provides potential habitat for this species, although the limited extent of such habitat limits the possibility that the species currently breeds here. Common yellowthroats were observed between January 2003 and April 2004 during surveys along Yosemite Slough, though it is unknown whether these were San Francisco common yellowthroats or migrants/wintering birds of other races.⁷¹⁴ Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the eastern part of the City, including the Project vicinity.⁷¹⁵

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “moderate” likelihood to occur within the Study Area.

Short-eared owl (Asio flammeus)

The short-eared owl, a California Species of Concern, is usually found in open areas with few trees such as annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and fresh emergent marshes. Its prey consists of small mammals, marsh birds, insects, reptiles, and amphibians.⁷¹⁶ The short-eared owl will usually nest on dry ground in a depression that is concealed in vegetation; occasionally the nest will be placed in a burrow. It requires dense vegetation for roosting and resting cover. This includes tall grasses, brush, ditches, and wetlands. Open, treeless areas containing elevated sites for perching are also needed. This species was observed by Alan Hopkins on the site⁷¹⁷ and the Study Area provides suitable foraging habitat for this species. As a result, short-eared owls are expected to forage occasionally in low numbers on the site. However, due to the extent of disturbance by humans and pets, the lack of extensive wetlands suitable for nesting, and the vulnerability of ground-nesting birds to predation in upland portions of the Study Area, short-eared owls are not expected to nest there. Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the City.⁷¹⁸

Using the likelihood of occurrence definitions provided in Table III.N-5, this is “known” to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

⁷¹² Shuford, W.D., The Marin County breeding bird atlas. Bushtit Books. Bolinas, California. pp. 479, 1993.

⁷¹³ Hobson, K., P. Perrine, E.B. Roberts, M.L. Foster and P. Woodin, *A breeding season survey of salt marsh common yellowthroats (Geothlypis trichas sinuosa) in the San Francisco Bay Region*. Report of the San Francisco Bay Bird Observatory to the US Fish and Wildlife Service, 1986.

⁷¹⁴ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁷¹⁵ San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

⁷¹⁶ <http://www.delta.dfg.ca.gov/gallery/shearowl.asp>.

⁷¹⁷ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁷¹⁸ San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

Tricolored Blackbird (Agelaius tricolor)

The tricolored blackbird, a California Species of Concern, is a highly social, marsh-nesting bird that lives in flocks numbering from less than one hundred to many thousands. Tricolored blackbirds are permanent residents of California, but birds make extensive migrations and movements, both in the breeding season and in winter, within their restricted range.⁷¹⁹ Tricolored blackbirds live in large colonies, and they prefer open accessible water, a protected nesting substrate such as flooded, thorny or spiny vegetation, and a suitable foraging space providing insect prey within a few miles of nesting colonies. Nesting habitat includes cattails and bulrushes or ungrazed grasslands containing tall grasses. Other plant species that are used for nesting include young willow thickets and wild rose. This species has been observed by Alan Hopkins on the Study Area⁷²⁰ and the site provides suitable foraging habitat for the species. However, no suitable breeding habitat is present, no colonies are known to occur in the area, and the *San Francisco Breeding Bird Atlas* did not confirm breeding by this species anywhere in the City.⁷²¹

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

White-tailed Kite (Elanus leucurus)

The white-tailed kite is listed as a fully protected species under Section 3511 of the *California Fish and Game Code*. White-tailed kites feed on rodents, small reptiles, and large insects in fresh emergent wetlands, annual grasslands, pastures, and ruderal vegetation. They breed between February and October. Kites often roost, and occasionally nest, communally especially during the non-breeding season. Therefore, disturbance of a relatively small roost or nesting area could affect a large number of birds. The white-tailed kite can commonly be observed foraging in extensive open grasslands throughout most of the San Francisco Bay region. While white-tailed kites were not observed during surveys conducted by PBS&J biologists on the Project site, small numbers of individuals were observed during the Yosemite Slough Wildlife surveys.⁷²² The species is not known to nest on the site⁷²³, but the grasslands and ruderal habitats on the Project site provide suitable foraging habitat for small numbers of non-breeding individuals that occasionally occur there.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is “known” to occur within the Study Area.

⁷¹⁹ Shuford, W. D., and Gardali, T., editors. 2008. *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

⁷²⁰ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

⁷²¹ San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.

⁷²² Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

⁷²³ Personal Communication between from Alan Hopkins to Steve Rottenborn, July 20, 2009.

Terrestrial Mammals

Western Red Bat (*Lasiurus blossevillii*)

The only special-status bat species likely to occur within the Study Area is the western red bat (*Lasiurus blossevillii*). The western red bat is not known to breed in San Francisco, but the species is migratory, and red bats occur here during migration and possibly during winter. Western red bats are not colonial, and, thus, the species is expected to occur in the Study Area only in small numbers. They are known to roost in the foliage of a number of tree species, including eucalyptus. Potential habitat for this species is present within the eucalyptus and other mature trees within the Project site. However, most bat species are sensitive to human-generated disturbance. Identification of bats requires special surveys that were not conducted for this analysis. Therefore, the conservative assumption is that this species of sensitive bat is present within the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “moderate” likelihood to occur within the Study Area.

Sensitive Aquatic Resources

Mollusks

Olympia Oyster (*Ostreola conchaphila*)

Native Olympia oysters were historically abundant in San Francisco Bay. Oyster beds are a cornerstone in the benthic habitat, improving water quality, and providing habitat complexity that favors fish and vegetation. They also provide an important link between pelagic and benthic food webs. Their function in the estuarine food web—oyster beds generally increase fish abundance and thus make up an essential part of the Essential Fish Habitat (EFH)⁷²⁴—they are considered an important resource within this EIR as only a few relict populations remain in the Bay.⁷²⁵

Recently, small populations of native oysters have been documented within the Bay.^{726,727} Detailed surveys for native oysters were not conducted as part of this Project. Suitable habitat is distributed throughout the shoreline of Study Area. Suitable substrate is solid surfaces to which the larvae can easily attach.⁷²⁸ Because of the larval forms of oysters are free-floating in the Bay, and a large population exists

⁷²⁴ National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) Species Distributions In San Francisco, San Pablo and Suisun Bays. Website: <http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay>. Accessed October 29, 2008.

⁷²⁴ National Marine Fisheries Service (NMFS). Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.

⁷²⁵ National Marine Fisheries Service (NMFS), No Date. *Native Oyster Habitat Restoration, Program Briefing Document*. Fisheries Southwest Region.

⁷²⁶ Harris, H.E., 2004. *Distribution and limiting factors of Ostrea conchaphila in San Francisco Bay*, MS Thesis, San Francisco State University.

⁷²⁷ Latta, M., 2006. Personal communication with Marilyn Latta, Habitat Restoration Director, Save the Bay, with D. Ebert and others at a meeting on October 18, 2006.

⁷²⁸ Harris, H.E., 2004. *Distribution and limiting factors of Ostrea conchaphila in San Francisco Bay*, MS Thesis, San Francisco State University.

south of the Study Area at Oyster Point Marina,⁷²⁹ native oysters are likely present on suitable substrate throughout the Study Area.

Fish

Green Sturgeon (*Acipenser medirostris*)

The southern distinct population segment of green sturgeon (including those that reside in the Sacramento River) was listed as threatened under the FESA by NMFS on April 7, 2006.⁷³⁰ Green sturgeon is a long-lived, anadromous, native fish that occurs in low numbers in the San Francisco Estuary and Sacramento River. Adults spawn in freshwater rivers from British Columbia south to the Sacramento River. In the Sacramento River, spawning occurs near Red Bluff and possibly in the Feather River. Larvae develop within these freshwater systems, migrate downstream, and remain in the estuaries for between 1 and 4 years before migrating to the ocean. Mature adults move into estuaries in the spring and spawning adults move up the rivers of their origins in late spring/early summer. Post spawning adults return to the estuary before migrating back to the ocean in late fall. Sub-adult fish also are thought to enter estuaries during summer and fall months. The Study Area is along the San Francisco Bay, which is a saltwater habitat; the Study Area does not support the necessary freshwater spawning habitat for adult fish.⁷³¹ Juvenile fish and sub-adults may rear in the adjacent waters of San Francisco Bay.

The NMFS designated critical habitat for green sturgeon on October 2009.⁷³² Specific areas designated as critical habitat include: coastal US marine waters within 60 fathoms depth (360 feet) from Monterey Bay, California, north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; and certain coastal bays and estuaries in California, Oregon, and Washington. The areas designated comprise approximately 320 miles of freshwater river habitat, 897 square miles of estuarine habitat (including the San Francisco Bay), 11,421 square miles of marine habitat, and 135 square miles of habitat within the Yolo and Sutter bypasses.⁷³³ Under the FESA, critical habitat includes those areas necessary to support the continued existence and recovery of this species. Critical habitat for green sturgeon includes all of San Francisco Bay. Critical habitat designations include the specific habitat and habitat functions that are necessary for the survival and recovery of the species; these are called primary constituent elements (PCEs). Within the estuarine category of critical habitat, the PCEs include food, flow, water quality, migratory pathways, depth, and sediment quality.⁷³⁴ Food is an abundance of prey items, benthic invertebrates and shrimp, within the substrate upon which sturgeon can forage. Flow refers to ample movement of water within the estuary to allow adults to orient to the Sacramento River during their

⁷²⁹ MACTEC Engineering and Consulting, Inc. 2008. *Oyster Point Marina Olympia Oyster Surveys Pre- and Post-Dredging February 2008, Oyster Point Marina, South San Francisco, California*. Prepared for PBS&J.

⁷³⁰ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon*, 71 Federal Register 17757, 2006.

⁷³¹ Moyle, Peter B. *Inland Fishes of California*, 2002, University of California Press.

⁷³² National Marine Fisheries Service (NMFS), *Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon*. 74 Federal Register 52300, October 9, 2009.

⁷³³ Ibid.

⁷³⁴ Ibid.

spawning migrations. Water quality refers to adequate levels of dissolved oxygen, salinity, and temperatures to allow for survival and growth. Water quality also includes low levels of contaminants that could affect survival or reproductive fitness. A migratory pathway refers to the fact that sturgeon migrate through the Bay to and from upstream spawning areas. The PCE for migratory pathways allows for safe and timely passage of fish between the ocean and upstream spawning areas, but it also includes localized movement of rearing and holding sturgeon within the Bay. The depth PCE refers to the variety of water depths required to provide suitable foraging, holding, and migratory areas. Sediment quality is important because sturgeons are benthic foragers (bottom feeders) and contaminant-free sediments support higher quality prey that do not affect the survival or reproductive fitness of the fish. The Study Area includes elements of all these PCEs. However, the sediment quality may be impaired by decades of industrial use, which has resulted in contamination (refer to Section III.K [Hazards and Hazardous Materials] of this EIR). This in turn probably reduces the foraging quality.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “high” likelihood to occur within the Study Area.

Chinook Salmon (Oncorhynchus tshawytscha)

Populations of Chinook salmon potentially found adjacent to the Project site fall into three Evolutionary Significant Units (ESUs): Winter-run, Spring-run, and Fall/late-Fall-run⁷³⁵ Chinook salmon. The runs of Chinook are distinguished based on the timing of the adult return to freshwater on their spawning migration. At almost any time of year, there are Chinook at some life cycle stage or another within San Francisco Bay (Table III.N-3 [Life Cycle Stages and Periods of Freshwater Residency for Chinook Salmon]). The occurrence of Chinook adjacent to the Project site could involve any of those life stages. Juvenile fish are more likely to be found adjacent to the Project site than adults because they are moving downstream from their natal streams and do not have the same swimming ability as adults. Juvenile fish from the Sacramento River populations would be expected to occur in low numbers as they stray south of the Golden Gate. Small numbers of Chinook have also recently appeared in Coyote Creek and Guadalupe River, which are both tributaries to south San Francisco Bay near Alviso; these fish are derived from hatchery releases within the native range of the species, which did not include the South Bay.^{736,737} Adult or juvenile fish from either of these populations would be expected to migrate through or past the Study Area on their way to and from the Pacific Ocean because the Study Area is between the Pacific Ocean and spawning sites in the South Bay. The overall likelihood of finding a substantial number of Chinook salmon within or adjacent to the Project site at any one time is relatively low because the open water of the Study Area is not considered suitable rearing habitat for either life stage. The residence time that either life stage may spend within or adjacent to the Project site is unknown.

⁷³⁵ Fall and late-fall run Chinook are treated as a single ESU by NMFS.

⁷³⁶ Santa Clara County, *Santa Clara County Habitat Plan, 1st Administrative Draft* August 2008. Website: http://www.scv-habitatplan.org/www/site/alias__default/292/1st_administrative_draft_hcp.aspx. Accessed July 2009.

⁷³⁷ National Marine Fisheries Service (NMFS). No Date. *Central Valley Chinook Salmon Distributions*. Southwest Regional Office. Website: <http://swr.nmfs.noaa.gov/hcd/dist2.htm>. Accessed July 17, 2009.

Table III.N-3 Life Cycle Stages and Periods of Freshwater Residency for Chinook Salmon

Species	Adult Migration (peak)	Spawning (peak)	Juvenile Freshwater Residency	Outmigration (peak)
Winter Run	Dec–July (Mar)	Apr–Aug (May–June)	5–10 months	July Oct
Spring Run	Mar–Sep (May–June)	Aug–Oct (Sep)	3–15 months	Nov–Mar (Jan–Mar)
Fall Run	June–Dec (Sep–Oct)	Sep–Dec (Oct–Nov)	1–7 months	Dec–Mar
Late Fall Run	Oct–Feb (Dec)	Jan–Apr (Feb–Mar)	7–13 months	Apr–June (Dec–Mar)

SOURCE: Moyle, 2002.

Winter-run Chinook are listed as endangered under the California and federal *Endangered Species Acts*. They spawn in the Sacramento River upstream of Red Bluff Diversion Dam and are distinguishable from other Chinook runs based on the timing of both upstream migration and the spawning season (Table III.N-3). Prior to the construction of Shasta and Keswick dams in 1943 and 1955, respectively, winter-run Chinook spawned in the upper reaches of the Sacramento, McCloud, and lower Pit rivers,⁷³⁸ and Battle Creek. Presently, the majority of winter-run Chinook spawning occurs on the main stem of the Sacramento River between Keswick Dam and the Red Bluff Diversion Dam.⁷³⁹ Designated critical habitat extends from Keswick Dam, Shasta County (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Critical habitat does not extend into the Study Area.

Spring-run Chinook salmon are listed as a threatened species under the California and federal ESAs. Spring-run Chinook enter the Sacramento River between March and September and move upstream into the headwaters, where they hold in pools until they spawn between August and October. Juveniles emigrate from the tributaries from mid-November through June; however, some juveniles spend a year in the streams and emigrate as yearlings the following October.⁷⁴⁰ Typically, spring-run Chinook salmon use mid- to high-elevation streams that provide appropriate low water temperatures and sufficient flow, cover, and pool depth to allow over summering. Spawning occurs between August and October and, depending on water temperature, emergence occurs between November and March. Although Spring-run Chinook salmon emigration is highly variable, the emigration period extends from November to early May, with up to 69 percent of young-of-the-year out migrants passing through the lower Sacramento River between mid-November and early January.⁷⁴¹ Designated critical habitat extends from Keswick Dam, Shasta County (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San

⁷³⁸ Moyle, P. B. 2002. *Inland Fishes of California*, University of California Press. 2002.

⁷³⁹ Ibid.

⁷⁴⁰ Ibid.

⁷⁴¹ Snider, B., and R.G. Titus. 2000. *Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing*, October 1996.

Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Critical habitat does not extend into the Study Area.

Central Valley Fall and Late Fall-run Chinook salmon are not listed under the state or federal endangered species act but are classified as a Species of Special Concern. Fall-run Chinook salmon is the most abundant ESU, documented to comprise about 80 percent of the Sacramento Basin stock in the early 1980s. The ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin River basins and their tributaries, east of Carquinez Strait, California. Juvenile fall and late fall-run fish could stray into open waters within and adjacent to the Project site if they miss the entrance to the Golden Gate and the Pacific Ocean.

A small population of Chinook salmon has become established in recent years in Coyote Creek and the Guadalupe River.⁷⁴² The regulatory status of this population is unclear because the fall/late fall-run ESU only includes naturally spawned fish from upstream of Carquinez Strait. There is not an ESU that includes fish spawning within the tributaries of San Francisco Bay. These fish exhibit a fall-run pattern similar to the fall-run ESU of the Central Valley, and are apparently derived from wandering individuals, likely hatchery-released fish, from that ESU.⁷⁴³ Regardless of where they came from or what their regulatory status may be, these fish would pass the Study Area on their way to and from the ocean.

Using the likelihood of occurrence definitions provided in Table III.N-5, the spring-run, winter-run/ and fall/late fall-run of this species has a “High” likelihood to occur within the Study Area.

Central Valley Steelhead (Oncorhynchus mykiss)

Central Valley steelhead (rainbow trout) were federally listed as a threatened species in 1998⁷⁴⁴ and this status was reaffirmed in 2006.⁷⁴⁵ The Central Valley steelhead population is a Distinct Population Segment (DPS; aka ESU) that includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries. Final critical habitat, designated in September 2005 for this species, does not include the Study Area.⁷⁴⁶ Critical habitat is designated by hydrologic unit, the closest of which to the Study Area is the Sacramento Delta Hydrologic Unit, over 25 miles north of the Project site.⁷⁴⁷ Central Valley steelhead, especially juveniles, may occasionally stray into the South Bay during their migration to the ocean, but the area adjacent to the Project site is generally outside their migratory pathway.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “low” likelihood to occur within the Study Area.

⁷⁴² Santa Clara County, *Santa Clara County Habitat Concept Plan, 1st Administrative Draft* August 2008. Website: http://www.scv-habitatplan.org/www/site/alias__default/292/1st_administrative_draft_hcp.aspx. Accessed July 2009.

⁷⁴³ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California*, 63 Federal Register 13347, 1998.

⁷⁴⁴ Ibid.

⁷⁴⁵ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead*, Final Rule, 71 Federal Register 834, 2006.

⁷⁴⁶ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California*, Final Rule, 70 Federal Register 52488, 2005.

⁷⁴⁷ Ibid.

Central California Coast Steelhead (*Oncorhynchus mykiss*)

The Central California Coast DPS of steelhead is a federally threatened species.⁷⁴⁸ This DPS includes all naturally spawned populations of steelhead from the Russian River south to, and including, Aptos Creek and includes the populations within San Francisco Bay.⁷⁴⁹ Steelhead begin their migration from the ocean when winter rains provide large amounts of cold water for migration and spawning. Peak migration period for adult fish is in mid-winter. They typically spawn in smaller streams and tributaries to mainstream rivers. Juvenile steelhead generally spends one to three years in freshwater before migrating to the ocean.⁷⁵⁰

It is highly likely that both adults and juvenile steelhead from this DPS could be found adjacent to the Project site. The closest potential steelhead spawning streams in South San Francisco Bay are San Mateo Creek (approximately 10 miles south of the Study Area), Alameda Creek (approximately 16 miles south of the Study Area), and San Francisquito Creek (approximately 22 miles south of the Study Area). Other South Bay watersheds that support populations of steelhead include the Coyote Creek and Guadalupe River watersheds. Because the Study Area is between their spawning and rearing streams and the Pacific Ocean, fish from any of these streams could be found in the Bay adjacent to the Project site during adult migrations from the Pacific Ocean to spawning sites or during juvenile migrations from their natal streams to the Pacific Ocean.

The final critical habitat designation for the Central California Coast steelhead DPS was issued on September 2, 2005.⁷⁵¹ The specific primary constituent elements considered in the designation were freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas. The lateral extent of critical habitat in estuarine areas is the area inundated by extreme high tide. The Study Area is within the designated critical habitat for this species.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “high” likelihood to occur within the Study Area.

Longfin Smelt (*Spirinchus thaleichthys*)

Longfin smelt were listed under the California Endangered Species account as a threatened species in March 2009. This species is endemic to the west coast of North America with small populations likely still present in the Klamath River and Russian River estuaries.⁷⁵² However, the bulk of the longfin smelt population appears to be in San Francisco Bay.⁷⁵³ Adults spawn in the Sacramento-San Joaquin Estuary almost as far upstream as the City of Sacramento on the Sacramento River and to Turner Cut on the San

⁷⁴⁸ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California*, 63 Federal Register 13347, 1998.

⁷⁴⁹ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead*, Final Rule, 71 FR 834.

⁷⁵⁰ Moyle, P. B. *Inland Fishes of California*, 2002, University of California Press, 2002.

⁷⁵¹ National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California*, Final Rule, 70 Federal Register 52488, 2005.

⁷⁵² Moyle, P. B. *Inland Fishes of California*, 2002, University of California Press, 2002.

⁷⁵³ California Department of Fish and Game (CDFG), A Status Review of the Longfin Smelt (*Spirinchus thaleichthys*) in California, January 2009.

Joaquin River.⁷⁵⁴ Adults spawn in these upstream freshwater locations in early winter. The larval smelt are distributed downstream by natural river flow. Because of this, the higher the outflow of freshwater from the Sacramento-San Joaquin Delta, the greater the distribution of smelt in the Bay. As they mature, swimming ability improves and their distribution expands. Adults occur into the South Bay and are also found in the ocean just outside the Golden Gate.⁷⁵⁵ This species could be found in the Study Area from spring to fall before adults return upstream to spawn.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a “moderate” likelihood to occur within the Study Area.

Pacific Herring (Clupea pallasii)

San Francisco Bay supports a small, yet productive commercial Pacific herring fishery. Pacific herring are not protected by either the state or the federal government; however, because herring are harvested for their roe, they are an important species in the economy of the San Francisco Bay Area and their populations are closely monitored by CDFG. Pacific herring are also an important species in the ecology of San Francisco Bay because herring, along with sardines and anchovies, are a primary food source for salmon and other sport fish. Pacific herring generally enter the Bay from November through April⁷⁵⁶ of each year and spawn in intertidal and sub-tidal habitats.⁷⁵⁷ The actual sites where Pacific herring spawn in San Francisco Bay change from year to year and spawning may occur within numerous locations around the Bay. The North Bay is typically the preferred spawning area, although limited spawning has historically been observed at San Mateo Point.⁷⁵⁸ The preferred substrate for herring spawning is eelgrass, followed by rocky seafloors, and lastly flat surfaces such as marina pilings, retaining walls, and bulkheads along the San Francisco Bay waterfront.⁷⁵⁹ According to NMFS, known herring spawning areas within the area immediately adjacent to the Project site include several piers and areas of shoreline both north and south of the proposed marina (refer to Figure III.N-4 [Pacific Herring Spawning Habitat]).⁷⁶⁰ Where Figure III.N-4 shows habitat as including piers, this refers to in-water portions of those structures. Also, the mapping data left gaps between the shoreline and the delineated habitat that is an artifact of the mapping. Spawning grounds could extend to the shoreline, especially in those areas where bulkheads define a vertical shoreline. The open channel to the northwest of the proposed marina between Blandy and E streets may be used by herring even though NMFS does not map it as spawning habitat.

⁷⁵⁴ Ibid.

⁷⁵⁵ Ibid.

⁷⁵⁶ National Oceanic and Atmospheric Administration (NOAA). 2008. San Francisco Bay Project Impact Evaluation System—Pile Driving. Coastal Restoration and Protection Division. Interactive GIS mapping software Website: <http://mapping2.orr.noaa.gov/website/portal/pies/naturalhistory.html>. Accessed December 2, 2008.

⁷⁵⁷ Barnhart, R.A. 1988. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Pacific herring*. US Fish and Wildlife Service Biol. Rep. 82(11.79). US Army Corps of Engineers, TR EL-82-4. 14 pp.

⁷⁵⁸ Miller, D. J. and J. Schmidtke. 1956. *Report on the distribution and abundance of Pacific herring (Clupea pallasii) along the coast of Central and Southern California*. California Fish and Game (CDFG) 42(3):163-187.

⁷⁵⁹ Barnhart, R.A. 1988. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Pacific herring*. US Fish and Wildlife Service Biol. Rep. 82(11.79). US Army Corps of Engineers, TR EL-82-4. 14 pp.

⁷⁶⁰ National Oceanic and Atmospheric Administration (NOAA). 2008. *San Francisco Bay Project Impact Evaluation System—Pile Driving*. Coastal Restoration and Protection Division. Interactive GIS mapping software Website: <http://mapping2.orr.noaa.gov/website/portal/pies/naturalhistory.html>. Accessed December 2, 2008.



SOURCE: NOAA PIESWebsite, 2008, Merkel and Associates 2003 SF Bay eelgrass survey.

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FIGURE III.N-4

Candlestick Point — Hunters Point Shipyard Phase II EIR
PACIFIC HERRING SPAWNING HABITAT

Essential Fish Habitat

The tidal aquatic habitats adjacent to the Project site are considered EFH by the NMFS for a species assemblage that includes anchovies, sardines, rockfish, sharks, sole, and flounder.^{761,762} Areas supporting the native Olympia oyster found in San Francisco Bay are also considered EFH by NMFS because oyster beds generally increase fish abundance. A more detailed discussion of the provisions of the *Magnuson-Stevens Fisheries Conservation Act*, by which effects on EFH are regulated, is provided below in Section III.N.3 (Regulatory Framework).

Wildlife Movement

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (i.e., juvenile animals from natal areas, or individuals extending range distributions); (2) seasonal migration; and (3) local movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover). A number of terms have been used in various wildlife movement studies, such as “wildlife corridor,” “travel route,” “habitat linkage,” and “wildlife crossing,” to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and facilitate the discussion of wildlife movement in this analysis, these terms are defined as follows:

- **Travel route**—A landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (i.e., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another. It contains adequate food, water, and/or cover while moving between habitat areas and provides a relatively direct link between target habitat areas.
- **Wildlife corridor**—A patch of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bounded by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and facilitate movement while in the corridor.
- **Habitat linkage**—Larger, landscape-level movement features (often referred to as “habitat or landscape linkages”) can provide both transitory and resident habitat for a variety of species to a more substantial, or wider, land connection between two habitat areas. Habitat linkages allow for the periodic exchange of animals between habitat areas, which is essential to maintain adequate gene pools.
- **Wildlife crossing**—A small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings may be manmade and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent “choke points” along a movement corridor.

⁷⁶¹ National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) Species Distributions In San Francisco, San Pablo and Suisun Bays. Website: <http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay>. Accessed October 29, 2008.

⁷⁶² National Marine Fisheries Service (NMFS). Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.

Surveys of the Project site did not identify any major or regional wildlife corridor/travel route. The Project site is surrounded by open water and urban development that isolate habitats in the Study Area from large expanses of similar habitats in undeveloped areas elsewhere along the San Francisco Bay shoreline and in the San Bruno Mountain State Park (approximately 2 miles to the southwest). There is localized movement, as ground-dwelling animals forage for food, mate, and move between habitat patches within the Project site. Although there is localized movement between Bayview Hill and the CPSRA, Bayview Hill is also isolated from larger expanses of habitat, and movement by mammals, reptiles, and amphibians between the site and any larger expanses of natural habitat (such as San Bruno Mountain to the southwest) is severely impeded by US-101 and other roads and urban development.

In addition, although bird flyways are not traditionally considered “wildlife movement corridors,” the San Francisco Bay’s wetlands and tidal lands serve as important habitat for bird species during migration through the Pacific Flyway. Many bird species use these areas as an annual stopover location for several days of rest and feeding prior to continuing migration. These habitats also provide critical staging areas for migratory species. Thus, the Study Area is a minor, but important component of the much larger Bay system that provides habitat for migratory birds.

III.N.3 Regulatory Framework

■ Federal

Section 404 of the Clean Water Act

Section 404 of the *Clean Water Act* (CWA) (33 *United States Code* [USC] §§ 1344) requires that a permit be obtained from the USACE prior to the discharge of dredged or fill materials into any “waters of the United States or wetlands.” Waters of the United States are broadly defined in the USACE regulations to include navigable waterways, their tributaries, lakes, ponds, and wetlands. Wetlands are defined as: “Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that normally do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”⁷⁶³ Wetlands that are not specifically exempt from Section 404 regulations (such as drainage channels excavated on dry land) are considered to be “jurisdictional wetlands.” The USACE is required to consult with the USFWS, NMFS, Environmental Protection Agency, and State Regional Water Quality Control Board (SWRCB) in carrying out its discretionary authority under Section 404.

The USACE grants three types of permits: individual, general, and nationwide. Project-specific individual permits are required for certain activities that may have a potential for more than a minimal impact and necessitate a detailed application. A permit from the USACE would be required for any placement of fill in waters of the US as part of the Project.

Section 402 of the Clean Water Act

The primary mechanism in the CWA regulating the discharge of pollutants is the National Pollutant Discharge Elimination System (NPDES), which is administered by the Environmental Protection

⁷⁶³ US Army Corps of Engineers, *Definition of Waters of the United States*, 33 CFR 328, November 1986.

Agency (EPA). Under the NPDES program, a permit is required from EPA or an authorized state for the discharge of any pollutant from a point source into the waters of the US (33 USC §§1342). Storm water pollution prevention plans must be prepared for construction activities as part of the NPDES permitting process.

Section 401 of the Clean Water Act

Section 401 of the CWA (33 USC §§ 1341) requires a state-issued Water Quality Certification for all projects requiring a Section 404 permit, or other federal permit or license. There are nine Regional Water Quality Control Boards (RWQCBs) across the state that issue Water Quality Certifications for various actions within their respective region. The RWQCB, San Francisco Bay Region, issues Section 401 Water Quality Certifications for the City and County of San Francisco. A Section 401 certification requires a determination that the Project will comply with all state water quality standards.

Federal Endangered Species Act (FESA)

The FESA was enacted in 1973. Under the FESA, the Secretary of the Interior and the Secretary of Commerce have the authority to list a species as threatened or endangered (16 USC 1533[c]). The FESA is administered by both the NMFS and the USFWS. The NMFS is accountable for animals that spend most of their lives in marine waters, including marine fish, most marine mammals, and anadromous fish such as Pacific salmon. The USFWS is accountable for all other federally listed plants and animals.

Pursuant to the requirements of FESA, a federal agency authorizing, funding or carrying out a project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present within the Study Area and determine whether the agency's action could affect any federally listed species (16 USC 1536(a)(2), (3).) If the action would likely affect a listed species, the agency must consult with the USFWS or NMFS under Section 7 of the FESA to determine whether the action is likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of designated critical habitat (16 USC 1536(a)(2).) Project-related adverse effects to these species or their habitats are typically considered significant under CEQA and thus would require mitigation.

The USFWS Regional Office in Sacramento maintains a list of "species of concern" that receive special attention from other federal agencies (i.e., NMFS) during environmental review, although they are not protected under FESA. Project-related impacts to such species could be considered significant under CEQA Guidelines section 15380 and could require mitigation.

Section 9 of the FESA prohibits any person or federal agency from "taking" endangered or threatened wildlife. The definition of "take" includes harassing, harming, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. A notable component of this definition is the definition of "harm." "Harm" in the definition of "take" means an act that actually kills or injures protected wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.

Projects that would result in “take” of any federally listed threatened or endangered species are required to obtain incidental take authorization from NMFS or USFWS through either the Section 7 (interagency consultation) process described above or Section 10(a) (incidental take permit) of FESA. The Section 7 authorization process is used to determine if a project with a federal nexus would jeopardize the continued existence of a listed species and what mitigation measures would be required to avoid jeopardizing the species. The Section 10(a) process allows take of endangered species or their habitat when no other federal government action is involved. Because the Project could affect a federally listed species and would require a federal (Section 404) permit, pursuant to Section 7 of the FESA, the USACE must initiate consultation with USFWS or NMFS prior to carrying out its discretionary authority under Section 404 of the CWA.

Migratory Bird Treaty Act (MBTA)

The federal *Migratory Bird Treaty Act* (MBTA; 16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in any native bird that may occur within the Study Area except in accordance with regulations prescribed by the Secretary of the Interior. It is an international treaty for the conservation and management of bird species that migrate through more than one country, and is enforced in the United States by the USFWS. This act encompasses whole birds, parts of birds, and bird nests and eggs and provides protection to over 800 species in the United States. All native birds in the Study Area are protected by the MBTA.

Marine Mammal Protection Act

The *Marine Mammal Protection Act* (MMPA) was enacted in 1972 and amended through 2007 (16 USC 1631). All marine mammals are protected by the MMPA, which prohibits their take in US Waters. Take is defined in the MMPA as “harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect” [16 USC 1631 Section 3(13)]. This is a slightly different definition than the FESA, which also encompasses “attempts” to engage in these activities. Under the MMPA, “harassment” is further defined as any action that of pursues, torments, or annoys a marine mammal and which has the potential to injure or disturb a marine mammal or marine mammal stock in the wild including alteration of behavior patterns including migration, breathing, nursing, breeding, feeding, or sheltering [16 USC 1631 Section 3(18(A))].

Species that occur within San Francisco Bay on a regular basis that are protected by the MMPA include the harbor seal and the California sea lion. The MMPA would apply to the Project, because in-water construction activities such as pile driving could harass these animals.

Magnuson-Stevens Fisheries Conservation Act and Management Act

The NMFS has the authority to implement the *Magnuson-Stevens Fisheries Conservation and Management Act* (Public Law 94-264; MSA). The *Magnuson-Stevens Act* (MSA) was amended and reauthorized on January 12, 2007, by the *Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act* (PL 109-479). The MSA was put into place to promote conservation and management of the Nation’s fishery resources. The MSA established the Pacific Fishery Management Council, which was tasked with creating the

Pacific Coast Groundfish Fishery Management Plan (FMP).⁷⁶⁴ The most recent amendment to the FMP was adopted by NMFS in May 2006.⁷⁶⁵ The FMP develops recommendations for the management of groundfish fisheries, and in some cases, it contains specific fishery management recommendations.⁷⁶⁶ In addition, the FMP addresses provisions in the MSA relating to EFH to ensure that fishery resources are managed through the regulation of EFH. The MSA defines EFH as “... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” [16 USC 1802 MSA Section 3(10)]. The terms in this definition have been further defined to include:⁷⁶⁷

- Aquatic habitat and associated physical, chemical, and biological properties that are used by fish (historically used areas may be included)
- Sediment, stream substrates, instream structure, and associated biological communities
- The habitat required to support a sustainable fishery including that particular species’ place in a properly functioning ecosystem
- The habitat required to support a full life cycle for the species under consideration

The tidal aquatic habitats adjacent to the Project site are considered EFH by NMFS for a species assemblage that includes anchovies, sardines, rockfish, sharks, sole, and flounder.^{768,769} Areas supporting the native Olympia oyster found in San Francisco Bay are also considered EFH by NMFS because oyster beds generally increase fish abundance. The NMFS consults with federal action agencies under the MSA in a process similar and often parallel to the Section 7 FESA consultation. Because the Project would modify designated EFH, consultation with NMFS under the MSA is anticipated and would be initiated by the USACE during the permitting process for the Project.

Section 10 of the Rivers and Harbors Act of 1899

Section 10 of the *Rivers and Harbors Act of 1899* (33 USC 403) gives the USACE jurisdiction over tidal waters of the US from the MHW elevation seaward (33 USC 403.382.4b). Specifically, it prohibits the construction, dredging, or fill of any navigable water without a permit from the USACE. This includes construction of breakwaters or marinas, installation of pilings, docks, or bridges, and excavation of existing substrates.

The Project would require placement of fill for bridge construction, shoreline revetments, breakwaters, installation of pilings and marina floats, and installation of gangways for access to the docks. All of these

⁷⁶⁴ PFMC (Pacific Fisheries Management Council) 2006. *Pacific Coast Groundfish Fishery Management Plan as revised through Amendment 19* (March 2006).

⁷⁶⁵ National Marine Fisheries Service (NMFS). 2006. *Magnuson-Stevens Act Provisions; Fisheries off West Coast States; Pacific Coast Groundfish Fishery: Final Rule*. 71 FR 27408.

⁷⁶⁶ National Marine Fisheries Service (NMFS). 2006. *Magnuson-Stevens Act Provisions; Fisheries off West Coast States; Pacific Coast Groundfish Fishery: Final Rule*. 71 FR 27408.

⁷⁶⁷ Pacific Fisheries Management Council (PFMC) 2003. *Pacific Coast Salmon Plan – Fishery management plan for commercial and recreational salmon fisheries off the coast of Washington, Oregon, and California as revised through Amendment 14* (adopted March 1999).

⁷⁶⁸ National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) *Species Distributions In San Francisco, San Pablo and Suisun Bays*. Website: <http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay>. Accessed October 29, 2008.

⁷⁶⁹ National Marine Fisheries Service (NMFS). Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.

activities would be subject to the USACE jurisdiction under Section 10 of the *Rivers and Harbors Act*, and USACE authorization of these activities must be obtained through the permitting process for the Project.

■ State

California Endangered Species Act (CESA)

The CESA was enacted in 1984. Under the CESA, the California Fish and Game Commission has the responsibility for maintaining a list of threatened and endangered species. Pursuant to the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the Study Area and determine whether the Project would have an adverse affect on such species. In addition, CDFG encourages informal consultation on any project that may impact a candidate species. Peregrine falcons nest within the Study Area, as noted above, and are listed as endangered under the CESA, although the species is proposed to be delisted.

Section 2080 of the *California Fish and Game Code* prohibits “take” of any species that the commission determines to be an endangered species or a threatened species. Take is defined in Section 86 of the *California Fish and Game Code* as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Sections 2081(b) and (c) of the *California Fish and Game Code* allow CDFG to issue an incidental take permit for a state-listed threatened or endangered species only if specific criteria are met, such as take incidental to an otherwise lawful activity. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project-caused losses of listed species populations and their essential habitats.

Fish and Game Code—Sections 1602, 3503, 3503.5, 3511, 3513, 4150, 4700, 5050, and 5515

California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Birds of prey are further protected under *California Fish and Game Code* Section 3503.5, which states that “it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto.” Construction disturbance during the breeding season could result in the incidental loss of eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by CDFG. Similarly, Section 4150 of the *California Fish and Game Code* describes protections for nongame mammals.

California Species of Special Concern is a designation used by the CDFG for some declining wildlife species that are not state candidates for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as having special status by the CDFG. Under CEQA Guidelines (Section 15380), potential impacts to these species must be assessed.

California laws relating to Fully Protected species (i.e., Section 3511) were among the first attempts in the nation to provide additional protection to animals that were rare or faced possible extinction, predating even the FESA. Most fully protected species have also been given additional protection under more

recent laws and regulations, and many have been listed under state and federal versions of the FESA. Fully Protected species (such as the peregrine falcon and white-tailed kite) may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Four sections of the *California Fish and Game Code* list 37 fully protected species (*California Fish and Game Code* Sections 3511, 4700, 5050, and 5515). Each of these statutes (1) prohibits take or possession “at any time” of the species listed in the statute, with few exceptions, (2) states that no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to “take” the species, and (3) states that no previously issued permits or licenses for take of the species “shall have any force or effect” for authorizing take or possession.

Section 1602 of the *California Fish and Game Code* requires a Streambed Alteration Agreement for any activity that may alter the bed and/or bank of a lake, stream, river, or channel. Typical activities that require a Streambed Alteration Agreement include excavation or fill placed within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. A Streambed Alteration Agreement would be required as part of the permitting process for this Project.

Porter-Cologne Water Quality Control Act

The *Porter-Cologne Water Quality Control Act* (California Water Code Sections 13000 et seq.) charges the SWRCB and the nine RWQCBs statewide with protecting water quality throughout California. Typically, the SWRCB and RWQCB act in concert with the USACE under Section 401 of the *Clean Water Act* in relation to permitting fill of federally jurisdictional waters. The US Supreme Court has acted to limit the regulatory jurisdiction of the USACE under Section 404 of the *Clean Water Act*.⁷⁷⁰ This action did not limit the State’s regulatory jurisdiction over Waters of the State.⁷⁷¹ Waters of the State are defined in Section 13050(e) of the *Porter-Cologne Water Quality Control Act* as “...any surface water or groundwater, including saline waters, within the boundaries of the state.”

Wetlands are delineated in accordance with methodology presented in the 1987 *Corps of Engineers Wetlands Delineation Manual*⁷⁷² and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.⁷⁷³ Applicants have this delineation verified by the USACE and, in cases where an area meets the criteria to be considered a wetland, but the USACE does not have jurisdiction, the applicant is referred to the appropriate RWQCB. For the Study Area, the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) could exercise its jurisdiction over wetlands where a project does not require a federal permit, but involves removal or placement of material into Waters of the State. The USACE has indicated that the waters and wetlands potentially impacted by the Project are subject to its jurisdiction. A

⁷⁷⁰ United States Supreme Court (USSC), *Solid Waste Agency of Northern Cook County v. US Army Corps of Engineers*. 531 US 159(2001), also known as the “SWANCC decision.”

⁷⁷¹ Guzy, G.S. and R.J. Andersen., *Memorandum from the Corps regarding: Supreme Court ruling concerning CWA jurisdiction over isolated waters*. Website: <http://www.spn.usace.army.mil/regulatory/swancc.pdf>, 2001.

⁷⁷² Environmental Laboratory, *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station. Vicksburg, Miss., 1987.

⁷⁷³ US Army Corps of Engineers, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, Wetlands Regulatory Assistance Program, Vicksburg, Miss., September 2008.

Section 401 clean water certification or waiver would be required as part of the permitting process for this Project.

■ Regional

The McAteer-Petris Act (California Government Code 66600–66682)

The *McAteer-Petris Act* created the San Francisco Bay Conservation and Development Commission (BCDC) in 1965. BCDC's mission is the preservation of San Francisco Bay from indiscriminate filling. BCDC's first task was compilation of a comprehensive study of the Bay and determination of how future development of the Bay should occur. This effort resulted in the San Francisco Bay Plan in 1968. In 1969 the findings and policies of the Bay Plan were incorporated into the *McAteer-Petris Act*, which was amended making BCDC a permanent state agency. The Bay Plan continues to evolve and remains the guiding document for BCDC's actions. Section 66610 of the *McAteer-Petris Act* establishes the boundaries of San Francisco Bay in relation to BCDC's jurisdiction. Essentially, all areas below the mean high tide line and an area within a shoreline band that extends landward for 100 feet from the mean high tide line are subject to their jurisdiction. Section 66632 of the *McAteer-Petris Act* establishes the permitting process for projects that would place fill in, on, or over any part of BCDC's jurisdiction as defined in Section 66610. Some aspects of the Project would be in the water or within the shoreline band and, therefore, subject to BCDC's jurisdiction.

Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) Management Plan

In 1999, under the authority of the federal FESA, NOAA Fisheries and the USFWS, and the CDFG, under the CESA, completed a programmatic consultation for the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) Management Plan⁷⁷⁴. NOAA Fisheries, USFWS and CDFG concluded that the LTMS program was not likely to jeopardize the continued existence of listed species under their jurisdiction. The respective biological opinions provided an incidental take statement, which authorized the take of listed species that may inadvertently occur during dredging and dredged material disposal activities that adhere to the environmental work windows set forth in the LTMS Management Plan. Therefore, permitted dredging activities that conform to the Environmental Work Windows can be completed without the need to consult with the resource agencies under the FESA and the CESA. Any project proposing to conduct dredging activities outside of the LTMS environmental work windows is required to undertake either informal or formal consultation with the appropriate resource agencies (NOAA Fisheries, USFWS, and CDFG).

San Francisco Bay Trail Plan

Refer to Section III.A Land use and Plans for a description of the Bay Trail Plan. Environmental Protection Policies relevant to the Project are listed below.

⁷⁷⁴ LTMS Environmental Work Windows Work Group. LTMS Informal work windows, Informal consultation preparation packet. Draft version 1.4. February 2004. Website: <http://www.spn.usace.army.mil/conops/informal.pdf>.

Environmental Protection Policies⁷⁷⁵

23. The Committee is aware of the ecological value of wetlands; in many cases, they provide habitat for a variety of endangered species. In the San Francisco Bay Area, these areas serve as a vital link in the Pacific flyway for feeding, breeding, nesting and cover for migratory birds. To avoid impacts in wetlands habitats, the Bay Trail should not require fill in wetlands, and should be designed so that use of the trail avoids adverse impacts on wetland habitats.
24. Future support facilities serving the Bay Trail should be designed and constructed in such a manner that they do not impact fish and wildlife resources, especially wetlands. These facilities should be located and designed in a way that no fill of wetlands will be required.
26. The path will not always follow the Bay shoreline; inland reaches may be more appropriate, especially for bicycle travel, in some parts of the San Francisco Bay region.
28. Where the alignment of the Bay Trail may more appropriately be located away from the shoreline in order to protect particularly sensitive habitats, access to shoreline areas may be possible by connecting the Bay Trail to existing loop trails and other interpretive facilities. These access points should be planned and designed to make clear the distinction between the continuous Bay Trail and the interpretive trail. (Features may include different trail surfaces, marked entry points to interpretive areas, expanded facilities for education and shoreline interpretation, signage, regulation and enforcement of regulations.)
29. Provision of land or funds for Bay Trail planning or construction shall not be considered mitigation for wetland losses.

Candlestick Point State Recreation Area General Plan

Refer to Section III.A Land Use and Plans for a description of the CPSRA GP. The following excerpt is related to natural resource management:⁷⁷⁶

It is the policy of the department to protect the scenic values and to enhance, manage, and protect the biotic and natural resources of the area, while fully realizing the potential of the area for fulfillment of outdoor recreation needs. A wetland restoration and management plan shall be developed for the area north and east of the extension of Yosemite Avenue to the Bay, an area known as the Nature Area. The plan shall include provisions for natural restoration and removal of debris, design of a shoreline configuration that provides a healthy intertidal action, revegetation, and wildlife habitat enhancement. This plan shall be developed in coordination with local, Bay protection, and wildlife agencies.

San Francisco Bay Plan

Refer to Section III.A Land Use and Plans for a description of the Bay Plan. A summary of the policies related to biological resources are provided below.

Policies Concerning Fish, Other Aquatic Organisms and Wildlife in the Bay, Tidal Marshes and Tidal Flats Around the Bay and Subtidal Areas in the Bay⁷⁷⁷

The SFBCDC shall protect native fish species, other aquatic organisms, other listed wildlife species and their specific habitats under the *California Endangered Species Act* or federal *Marine Mammal Protection Act*

⁷⁷⁵ Bay Trail Plan. 1999. Electronic file: <http://baytrail.abag.ca.gov/baytrailplan.html#designguidelines>. July 30.

⁷⁷⁶ State Department of Parks and Recreation. Candlestick Point State Recreation Area General Plan, March, 1988.

⁷⁷⁷ SFBCDC, San Francisco Bay Plan, Reprinted February 2008.

within the Bay's tidal marshes, tidal flats, and subtidal habitat. To the greatest extent feasible, specific habitats such as tidal marsh, tidal flats, and subtidal habitats shall be conserved, restored, and increased. Specific habitats that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, species that the CDFG has determined are candidates for listing as endangered or threatened under the California *Endangered Species Act*, or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes. In reviewing or approving habitat restoration programs the SFBCDC should follow the recommendations in the Baylands Ecosystem Habitat Goals and provide a diversity of habitats for native aquatic and terrestrial plant and animal species. For projects that may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species the SFBCDC should consult and give appropriate consideration to the recommendations of the California Department of Fish and Game and the US Fish and Wildlife Service or the National Marine Fisheries Service and not authorize projects that would result in the "taking" of any plant, fish, other aquatic organism or wildlife species listed as endangered or threatened pursuant to the state or federal endangered species acts, or species that are candidates for listing under the CESA, unless the project applicant has obtained the appropriate "take" authorization from the US Fish and Wildlife Service, National Marine Fisheries Service or the California Department of Fish and Game. However, the SFBCDC may permit a minor amount of fill or dredging in wildlife refuges, shown on the Plan Maps, necessary to enhance fish, other aquatic organisms and wildlife habitat or to provide public facilities for wildlife observation, interpretation and education.

Policies Concerning Shoreline Protection around the Bay⁷⁷⁸

New shoreline erosion control projects and the maintenance or reconstruction of existing erosion control facilities should be authorized if (a) the project is necessary to protect the shoreline from erosion; (b) the type of the protective structure is appropriate for the project site and the erosion conditions at the site; and (c) the project is properly designed and constructed. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design of erosion control projects.

Policies Concerning Dredging in the Bay⁷⁷⁹

Dredging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay and certain waterways over time to achieve the LTMS goal of limiting in-Bay disposal volumes to a maximum of one million cubic yards per year. The LTMS agencies should implement a system of disposal allotments to individual dredgers to achieve this goal only if voluntary efforts are not effective in reaching the LTMS goal. In making its decision regarding disposal allocations, the Commission should confer with the LTMS agencies and consider the need for the dredging and the dredging projects, environmental impacts, regional economic impacts, efforts by the dredging community to implement and fund alternatives to in-Bay disposal, and other relevant factors. Small dredgers should be exempted from allotments, but all dredgers should comply with the SFBCDC policies.

⁷⁷⁸ Ibid.

⁷⁷⁹ Ibid.

■ Local

Yosemite Slough Restoration Plan

The Yosemite Slough Restoration Plan (2005) was developed on behalf of the State Parks Department, in accordance with the CPSRA GP. The restoration of Yosemite Slough would create the largest contiguous wetland area in San Francisco. The restoration project would help restore essential wildlife habitat, improve water quality, and prevent erosion along the shoreline of the City—an area of the bay where tidal wetlands have been most impacted and suffered the greatest loss due to urbanization.

Goals and objectives of the restoration include the following:

- Increase the area subject to tidal influence by excavating three areas that were formerly part of San Francisco Bay.
- Restore habitat diversity by adding 12 acres of tidally influenced wetlands and marsh area and remove chemically impacted soils from upland areas to improve the quality of existing habitat.
- Improve habitat for special-status species (i.e., western snowy plover and double-crested cormorants) by creating two nesting islands.
- Improve the quality of life for the surrounding community by creating a clean, beautiful local park for viewing wildlife habitat.
- Create an environmental area that local schools can use for field trips.
- Connect to the Blue Greenway, an important effort to build 13 miles of Bay Trail along the southern waterfront of the San Francisco Bay Trail.

City of San Francisco General Plan

The following goals and policies related to biological resources protection are included in the Environmental Protection Element of the *San Francisco General Plan*, and are relevant to the Project:

General

- | | |
|-------------|---|
| Objective 1 | Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources. |
| Policy 1.1 | Conserve and protect the natural resources of San Francisco. |
| Policy 1.2 | Improve the quality of natural resources. |
| Policy 1.3 | Restore and replenish the supply of natural resources. |
| Policy 1.4 | Assure that all new development meets strict environmental quality standards and recognizes human needs. |

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. |

Land

Objective 7 Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

Policy 7.3 Require that filling of land adhere to the highest standards of soils engineering consistent with the proposed use.

Flora and Fauna

Objective 8 Ensure the protection of plant and animal life in the City.

Policy 8.1 Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

Policy 8.2 Protect the habitats of known plant and animal species that require a relatively natural environment.

Policy 8.3 Protect rare and endangered species.

San Francisco Municipal Code

Urban Forestry Ordinance

The City provides protection for trees around the City by way of its Urban Forestry Ordinance (Ord. 165-95, App. 5/19/95), Article 16, Sections 806 (Planting and Removal of Street Trees) through 810 (Significant Trees) of the *Public Works Code*. "Significant trees" are defined as trees within 10 feet of a public right-of-way that also meet one of the following size requirements: 20 feet or greater in height; 15 feet or greater in canopy width; or 12 inches or greater diameter of trunk measured at 4.5 feet above grade. Among the factors considered in the removal of significant trees are the following: their size, age, and species; visual and aesthetic characteristics; cultural or historic characteristics; ecological and location characteristics. Street trees are also protected by the City's Urban Forestry Ordinance and both require a permit for removal. The ordinance also provides a process for designating trees as landmark trees, and protects significant, landmark, and street trees during construction activities. This ordinance applies to limited areas of the Project site where there are significant trees, street trees, and/or landmark trees.

Planning Code

Section 143 of the San Francisco Planning Code requires the installation of one street tree for each 20 feet of property frontage along each street or alley, with any remaining fraction of 10 feet or more of frontage requiring an additional tree for the owner or developer of a new or relocated building, or a building with 20% or more floor area expansion in specified districts.⁷⁸⁰ This ordinance applies to the R, SPD, RSD, NC, C-3, DTR, MUG, MUO, MUR, UMU, SLR, SLI, and SSO Districts.

⁷⁸⁰ Amended by Ord. 414-85, App. 9/17/85; Ord. 69-87, App. 3/13/87; Ord. 115-90, App. 4/6/90; Ord. 298-08, File No. 081153, App. 12/19/2008.

III.N.4 Impacts

■ Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to biological resources, but generally consider that implementation of the Project would have significant impacts if it were to:

- N.a Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.
- N.b Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS.
- N.c Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- N.d Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- N.e Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- N.f Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

■ Analytic Method

As mentioned in Section III.N.2 (Setting), PBS&J staff biologists reviewed existing studies of the Project site and conducted reconnaissance-level surveys of the Project site on August 9, 2007, May 5, 2008, and July 8, 2008.

The analysis provided below considers the potential direct, indirect, and cumulative effects of construction and implementation of the Project described in Chapter II, including both on-site and off-site impacts. Potential impacts are analyzed using information identified in Chapter II, the environmental setting for biological resources, results of literature and field surveys, and the adequacy of on-site habitat for potentially occurring special-status species, and comparing this information to the Significance Criteria that were identified in the previous section. In general, impacts are separated by plan element (i.e., Candlestick Point and HPS Phase II) and are indicated by an “a” and “b,” respectively, in the impact number. In addition, several impacts contain separate discussions of the proposed bridge over Yosemite Slough.

Identifying the impacts to biological resources that would result from construction of the CP/HPS Project is complicated by the fact that future remediation activities would modify existing site conditions before some CP/HPS Project components are constructed. As a result, the “baseline conditions” for the purpose of the Settings section above (i.e., existing conditions observed during field surveys conducted in the preparation of this EIR, plus other data collected or research conducted within the Study Area since 2003) are not necessarily the conditions that would be present when Project components are constructed.

For example, on Parcels E and E-2, it is expected that remediation by the Navy would result in the removal and/or capping of contaminated materials and construction of a shoreline revetment that would prevent erosion of materials on these parcels. These remediation activities (including revetment construction) would result in impacts to most of the wetlands that have been identified on Parcels E and E-2. As mitigation of these impacts, the Navy has proposed constructing new wetlands in the southwestern portion of HPS after remediation efforts are completed. Although the CP/HPS Project may construct the Yosemite Slough bridge and its approaches before the Navy's remediation efforts are concluded, other portions of Parcels E and E-2 are not expected to be improved as part of this Project until the Navy has completed its removal of radiological contamination. As a result, when CP/HPS improvements are made, wetlands on Parcels E and E-2 may be limited to the Navy's wetland mitigation site, with the remaining wetlands impacted by the Navy's fill and the revetment. To adequately characterize the impacts of the CP/HPS Project to biological resources, impacts to potentially affected resources (such as wetlands) are analyzed under two scenarios: assuming construction of Project improvements occurs prior to completion of Navy remediation activities, and assuming Navy remediation occurs first.

Impacts to special-status species would be significant (in the absence of mitigation) if the Project would adversely affect any of the following: (1) a species listed as threatened or endangered by the state or federal government at the time the Draft EIR is published; (2) a major population or subpopulation of a species that would result in the regional decline of this species; (3) a relatively large number of individuals within a population that is considered rare or declining; (4) a species' metapopulation (i.e., if one of only a few known populations occurs in the impact zone, or if the species has extremely narrow habitat requirements); or (5) a habitat type or vegetation community in regional decline or that is regionally endemic and is recognized as such by the local, state, or federal agencies identified in the Setting section. As discussed in the Setting section, those species or habitats with a "Not Likely," or "Absent" likelihood of occurrence in Table III.N-5 will not be addressed further as they are not expected to occur on the site or be affected by the Project.

Impacts to sensitive or rare species would be less than significant, even without mitigation, if they are not expected to substantially affect species or populations because (1) a relatively small number of non-listed individuals would be impacted; (2) the number of individuals of a non-listed species to be impacted represent a very small fraction of regional populations due to the species' regional abundance; (3) recovery and conservation efforts are documented to adequately conserve the species or habitat, and impacts would not affect the recovery or conservation of this species or habitat; or (4) the species or habitat is locally common and fairly abundant in the region.

This section presents Project Impacts at the conclusion of the discussion of individual impacts at Candlestick Point and HPS Phase II, beginning with Impact BI-22 and concluding with Impact BI-26.

■ Construction Impacts

Impact BI-1: Regional Conservation Plans

Impact BI-1 **Implementation of the 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. (No Impact) [Criterion N.f]**

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans that cover the Study Area. Therefore, the Project would not conflict with a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Consequently, no impact to such plans would occur. No mitigation is required.

Impact BI-2: Common Species and Habitats

Impact BI-2 **Implementation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any common species or habitats through substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant) [Criterion N.d]**

As listed in the Setting section, numerous common plant and wildlife species occupy the Study Area. Common wildlife includes a number of species of invertebrates, reptiles and amphibians, birds, and mammals (terrestrial and aquatic). Common aquatic resources include many species of fish, shellfish, and mollusks. Common plant communities include non-native annual grassland and landscaped areas/ornamental plants. Common species and habitats would be affected through the removal and construction of buildings, removal of trees, shoreline improvements, installation of trails, roads, and other facilities, construction and operation of the stadium and Yosemite Slough bridge, increased foot and vehicular traffic, installation of towers, and operation of stadium lights. As a result, some common habitats would be reduced in extent, and some common species would decline in abundance as a result of the Project. However, the Project's impact to common species and habitats would not be substantial. These species/habitats are abundant throughout the San Francisco Bay region, and the Project site supports an extremely small proportion of the regional abundance of these resources. Further, the abundance of many of these species on the Project site itself is relatively low due to the extent of developed/urban land uses on the site, the long history of disturbance of the site, the intensive nature of such disturbance in some areas (e.g., where remediation activities on HPS are occurring or have recently occurred), and the site's isolation from more extensive areas of natural habitat by the Bay and by urban development in surrounding areas. Those species that are present on the site in higher numbers consist primarily of species that are well adapted to urban or heavily disturbed areas. Consequently, any impacts of the Project on common species and habitats would have a negligible effect on regional population and would thus be less than significant. No mitigation is required.

The habitat disturbance caused by the Project would result in a less-than-significant impact to regionally common species and habitats, and, in addition, the Project proposes multiple measures to further avoid and minimize impacts to common vegetation communities and wildlife species, and to enhance habitat conditions for a number of species, such as migratory birds. Specifically, the Project includes implementation of a Draft Parks, Open Space, and Habitat Concept Plan⁷⁸¹ (provided in Appendix N3 [Draft Parks, Open Space, and Habitat Concept Plan] to this EIR) that would take advantage of opportunities for enhancing the ecological functions and values of the parks and open space areas on the Project site. These enhancement measures would focus on areas outside the CPSRA, since the Project would neither impact directly, nor have control over enhancements in, the portion of the CPSRA that is not subject to the land transfer agreement. However, the Draft Parks, Open Space, and Habitat Concept Plan would suggest enhancements that would provide ecological benefits within the CPSRA, should State Parks decide to implement them. Some of the measures that would be included in the Draft Parks, Open Space, and Habitat Concept Plan, and that would be implemented on the Project site, include:

- **Control of non-native invasive species:** The Project site is currently dominated by non-native plants, and several are particularly invasive, having the potential to expand over large areas and significantly reduce the ecological value provided by the proposed habitat enhancements. Invasive, non-native species would be removed during initial habitat enhancement efforts, and monitoring and ongoing removal/control would be implemented to ensure against the re-establishment and spread of these species on the Project site.
- **Restoration of grasslands:** To maintain grassland-associated wildlife species on the site, grasslands extensive enough to support such species would be maintained and enhanced through the restoration of native grasses. Such grassland habitat would not be well manicured or regularly mown. No trees would be planted within designated grassland management areas, and shrub cover would be limited to a few small, scattered patches of low-statured coastal scrub plants, which will provide cover for wildlife that may otherwise forage in the grasslands. Native-dominated grassland habitat would be created, which would result in a net gain for the site.
- **Increase in tree/shrub cover:** Numerous trees (approximately 10,000 net new trees, which is more than four times the number currently present on the Project site) and shrubs (particularly natives) would be planted and maintained to provide cover for mammals, reptiles, and amphibians and enhance habitat suitability for birds. The trees would be planted at the Project site and in the community, and the shrubs would be planted at the Project site. Trees and shrubs would be particularly beneficial as foraging habitat for Neotropical and other long-distance migrant birds. Increases in foliage height diversity and vegetation volume resulting from the planting of numerous trees and shrubs on the site, most of which currently supports little woody vegetation, would result in increases in the diversity and abundance of breeding and migratory birds. While native vegetation shall be favored, site-appropriate non-native trees and shrubs that provide food or structural resources that are particularly valuable to native wildlife may also be considered.
- **Maintenance of habitat connectivity:** Roads, trails, and buildings would interrupt habitat connectivity to some extent. However, park planning and maintenance/landscaping of open space areas can maintain connectivity within the site for less mobile animals such as mammals, reptiles, and amphibians through the wildlife-friendly design of potential obstacles (i.e., fences, walls, and curbs), maintenance of a vegetated band along the shoreline, and planting of vegetative cover that provides refugia for dispersing animals.

⁷⁸¹ Lennar Urban, *Draft Parks, Open Space, and Habitat Concept Plan*, November 2009.

- **Maintenance of refugia for waterbirds:** In planning for future trails, vistas, and other features/facilities expected to concentrate human activities along the waterfront, at least one shoreline area where waterbirds can roost at high tide would remain removed from trails or other shoreline access points for humans. In addition, the bases of the three piers in the southeastern corner of HPS Phase II would be removed to prevent mammals from accessing these piers, and the piers would be left in place to provide roosting sites for gulls, cormorants, pelicans, and terns.
- **Provision of nest boxes:** Nest boxes for birds would be placed in appropriate locations throughout parks and open space areas.

With implementation of the Draft Parks, Open Space, and Habitat Concept Plan, many wildlife species would benefit from the removal of invasive species, enhancement, restoration, and management of habitats such as grasslands and wetlands, and the planting of numerous trees and shrubs in areas that are currently highly degraded or disturbed. Specifically, extensive planting of native vegetation would enhance the vegetation community and provide areas of enhanced habitat for common butterflies, birds, small mammals, reptiles, and amphibians on the Project site. For most species, the benefits of such enhancements would accrue to local, rather than regional, populations, as there is no substantive dispersal of most wildlife species between the site and off-site areas. However, in the case of migratory birds, the Project would result in a net benefit that would have regional or Flyway-level implications, as the Project would enhance foraging habitat that is used by birds breeding and wintering in areas far from the Study Area. Further, the Draft Parks, Open Space, and Habitat Concept Plan would identify enhancement opportunities within open space areas that can be beneficial to other common species or habitats. A discussion of potential effects of the Project on common species by wildlife type is included below.

Invertebrates

Of 14 butterfly species recorded on the Project site during the Yosemite Slough Watershed Wildlife Survey, 13 species are common and widespread and are associated with host plants that are also widespread. These butterflies would benefit from increased habitat and foraging opportunities within the proposed native habitats and landscaping plantings as a result of the Project. The western pygmy blue, which was recorded infrequently (no more than one individual on a given survey), is associated with salt marshes and is, therefore, of more limited distribution. Nevertheless, this species is found in salt marshes throughout the San Francisco Bay area and was recorded very infrequently during the Yosemite Slough Watershed Wildlife Survey. As a result, the Project would have a negligible effect on regional populations of the species, and impacts to this and other butterfly species would be less than significant. The Project would maintain and enhance habitat for the pygmy blue through restoration, creation, or enhancement of salt marsh habitat along the shoreline. As a result of salt marsh restoration on the outboard side of revetments on portions of Candlestick Point and HPS Phase II, the Project is expected to create at least as much salt marsh habitat as it impacts.

Reptiles and Amphibians

The Project would maintain habitat for all five of the reptiles (southern alligator lizard, western fence lizard, gopher snake, ring-necked snake, and western garter snake) and the single amphibian (California slender salamander) recorded on the Project site by the Yosemite Slough Watershed Wildlife Survey.

Providing additional ground cover (i.e., shrubs) would improve habitat in some areas, especially in HPS Phase II, which has been subjected to intensive disturbance from remediation efforts.

Local abundance of these species may decline in some areas due to a reduction in dispersal (resulting from trails, roads, and increased vehicular traffic and human presence) and possibly increased vehicular mortality, but all six of these species are regionally abundant, and the Project's impacts would have a negligible effect on regional populations. In addition, the new and improved parkland components of the Project would provide new and/or enhanced habitat for reptiles and amphibians, which would be a localized beneficial impact in portions of the site.

Birds

Of 118 bird species observed during the Yosemite Slough Watershed Wildlife Survey, 51 (43 percent) were represented by a maximum count (the maximum number of individuals recorded on a given survey) of 5 or fewer, and thus use the Project site in low numbers. The most abundant wildlife species recorded were waterbirds. Project impacts to waterbird habitat within the Yosemite Slough bridge footprint would be mitigated by a contribution to the restoration of Yosemite Slough or restoration elsewhere on site or off site, as discussed under mitigation measure MM BI-4.1 below. Increased human use of the Project site may reduce abundance in aquatic habitats along the immediate shoreline, but ample aquatic habitat is present around the Project site, and, even without restoration, no substantial changes in common waterbird abundance (particularly relative to regional populations) are expected as a result of the Project.

Of the 57 species of landbirds recorded, only 20 were represented by maximum counts of 10 or more, indicating that most landbirds use the study area only in low numbers. In addition, most of these species are regionally abundant species adapted to a variety of habitat types, including the disturbed, non-native dominated habitats that currently occupy most of Candlestick Point and HPS Phase II. Although many landbird species would increase in abundance due to the provision of much more extensive trees and shrubs than are currently present, a few regionally abundant landbirds associated with extensive grasslands and weedy areas (such as meadowlarks and wintering grassland sparrows) may fluctuate in abundance within the Project site. However, incorporation of grasslands in open space areas and restoration of suitable foraging habitat on portions of the Project site would maintain habitat for these species on the site by ensuring that there is habitat for small birds, reptiles, mammals, and insects, which are the primary prey for the locally occurring raptor species.

The Project would result in a net benefit to many avian species. The Project would include approximately 105 acres and 232 acres of parkland and open space improvements at Candlestick Point and HPS Phase II, respectively. Although portions of this parkland may serve primarily recreational purposes, parks in the Project area would provide an opportunity for planting of trees and shrubs that would be used by numerous birds. For example, the 82-acre⁷⁸² Grasslands Ecology Park on the southern portion of HPS would be designed and landscaped to provide a variety of habitats, including extensive grasslands as well as a mosaic of trees, shrubs, and other vegetation. A Draft Parks, Open Space, and Habitat Concept Plan, which is required by mitigation measure MM BI-7b below, would include the planting of approximately 10,000 net new trees (more than four times the number currently present in the Project

⁷⁸² This acreage reflects the area of parklands that would be suitable for on-site species, and represent only a portion of the total new park lands that would be created by the Project.

area), in addition to shrubs and other vegetation, which would serve as perching, roosting, nesting, and foraging sites for a variety of birds. The trees would be planted at the Project site and in the community, and the shrubs would be planted at the Project site. These new and improved Project components would provide both raptor foraging opportunities and enhanced habitat for certain raptor prey species that could result in higher prey base for raptors. Some waterbirds (i.e., gulls, terns, cormorants, and pelicans) would benefit from the enhanced roost sites offered by the proposed three piers, which would provide nesting and roosting sites that would no longer accessible to mammalian predators. Neotropical and other long-distance migrants, the landbird group using the site that is of greatest conservation concern, would receive a considerable net benefit from the Project. Increases in foliage height diversity and vegetation volume resulting from the planting of numerous trees and shrubs on the site, most of which currently supports little woody vegetation, would result in increases in the diversity and abundance of both breeding and migratory birds.^{783,784,785} Well-vegetated sites nearby, such as Golden Gate Park and Coyote Point, provide much higher density and structural diversity of vegetation than is currently present on HPS Phase II and most of Candlestick Point, and these locations are known by birders to support high species diversity and abundance of birds, including Neotropical and other long-distance migrants.⁷⁸⁶ With the Project's revegetation component and addition of new parklands, the Project would provide a net enhancement of breeding, wintering, and migratory stopover habitat for birds.

Mammals

Of the ten mammal species recorded in the Study Area during the Yosemite Slough Watershed Wildlife Survey, three are non-natives (domestic dog, domestic cat, and Norway rat); two are common urban-adapted species (raccoon and striped skunk); and one occurs infrequently in aquatic areas (harbor seal). Of the remaining four species, the Botta's pocket gopher and California vole were represented by no more than one individual on a given survey and thus may be uncommon on the site. These two species, and the California ground squirrel and black-tailed jackrabbit, may decline in abundance on portions of Candlestick Point as extensive weedy/grassland habitats are converted to a mosaic of uses and habitats. However, numbers of these species in open space in HPS Phase II are currently expected to be low due to disturbance from remediation efforts, and enhancement and management of grassland habitat in this area may increase numbers of these species there. Specifically, habitat values on southern HPS Phase II, which has been heavily impacted by remediation efforts, would be enhanced considerably by management of a diverse mosaic of habitats, including native-dominated grasslands and patches of native and site-appropriate trees and shrubs. This area would, therefore, provide new and substantially improved habitat that small mammals can utilize and occupy.

Over time, numbers of some of these small-mammal species may decline due to a reduction in dispersal between patches of suitable grassland habitat and increased urbanization, but all of the terrestrial mammals on the site are regionally abundant and the reduction in their numbers within the site would have a negligible effect on regional populations. The Project would include approximately 105 acres and 232 acres of parkland and open space improvements on Candlestick Point and HPS Phase II,

⁷⁸³ MacArthur, R. H. and J. W. MacArthur. 1961. On bird species diversity. *Ecology* 42:594-598.

⁷⁸⁴ Karr, J. R. 1968. Habitat and avian diversity on strip-mined land in east-central Illinois. *Condor* 70:348-357.

⁷⁸⁵ Mills, G. S., J. B. Dunning, Jr., and J. M. Bates. 1991. The relationship between breeding bird density and vegetation volume. *Wilson Bulletin* 103:468-479.

⁷⁸⁶ Richer, C. (ed.) 1996. *San Francisco Peninsula Birdwatching*. Sequoia Audubon Society.

respectively. Although portions of this parkland may serve primarily recreational purposes, parks in the Project area would provide an opportunity for planting of vegetation that would provide cover and other resources for use by mammals. The Project would include an 82-acre⁷⁸⁷ Grassland Ecology Park that would, at a minimum, contain 43 acres of native-dominated grassland habitat. This grassland would be managed specifically for grassland-associated species, providing enhanced native habitat and foraging opportunities for several mammal species. These new and improved Project components (as implemented through mitigation measure MM BI-7b) would provide new and/or enhanced habitat conditions for small and medium-sized mammals, which would be a beneficial impact.

Fish, Shellfish, and Mollusks

Although no formal fish surveys have been performed, many areas of open water support an array of common estuarine/marine species from encrusting tunicates, sponges, and algae to bottom-dwelling fish (halibut, flounder, and sole), to more open water fish like anchovies, herring, and sardines. Under the worst-case scenario, the Project would affect approximately 29 acres of aquatic habitat, which would have the potential to affect these common species both directly through mortality of individuals or loss of habitat and indirectly through mechanisms such as increased competition, decreased water quality or other common impacts associated with in-water construction. However, the San Francisco Bay is approximately 400 square miles in area, and many of the common species that would be affected by the Project would have ample areas to relocate to. Those individuals that would experience direct mortality represent a very small proportion of the regional populations of these common species. Consequently, the Project's impacts would have a negligible effect on regional populations of common fish and aquatic invertebrates (however, refer to Impact BI-12a and Impact BI-12b below regarding impacts to EFH).

Impact BI-3: Sensitive Plants

Impact of Candlestick Point

Impact BI-3a Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No impact) [Criteria N.a and N.b]

Candlestick Point is largely developed. Those areas not developed are highly modified and support only ruderal (disturbed) habitats and ornamental landscaping. Most vegetation in the area has been introduced as landscape plants and turf grass or consists of weedy, non-native species that readily colonize recently disturbed areas. Special-status plants were not observed during any of the focused botanical surveys in 2007 or 2008.⁷⁸⁸ Disturbances include: a lack of natural fire regimes (largely since Euro-American settlement); construction of Candlestick Park stadium and associated roads and parking areas; development of CPSRA; increasing competition from invasive non-native species; and on-going disturbances such as vegetation management, trash, and pedestrian traffic. These disturbances have

⁷⁸⁷ This acreage reflects the area of parklands that would be suitable for on-site species and represent only a portion of the total new park lands that would be created by the Project.

⁷⁸⁸ Caltrans, Natural Environmental Study Report for the Bayview Transportation Improvements Project, Jones and Stokes, July 2007.

resulted in urbanization of almost all of Candlestick Point. The remaining vegetated areas have been reduced in quality. Because no special-status plants have been observed and the site generally does not support the preferred or required soils (i.e., serpentine) needed to support special-status plant species, sensitive plant species are considered absent from Candlestick Point. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-3b **Construction at HPS Phase II and construction of the Yosemite Slough bridge would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No impact) [Criteria N.a and N.b]**

HPS Phase II is dominated by industrial and developed areas. The southern shoreline of HPS Phase II and the bridge footprint area is a mixture of salt marsh, seasonal brackish marsh, freshwater seasonal wetland, and non-native annual grassland. Special-status plants were not observed during any of the focused botanical or rare plant surveys in 2007 or 2008.⁷⁸⁹ Factors limiting rare plant occurrences within this area include: a lack of natural fire regimes (largely since Euro-American settlement); early maritime development; and construction of a World War II-era Shipyard, as well as post-war development. Those actions have resulted in urbanization of almost all of HPS Phase II. Because no special-status plants have been observed and the site generally does not support the preferred or required soils (i.e., serpentine) needed to support special-status plant species, sensitive plant species are considered absent from HPS Phase II and Yosemite Slough bridge areas. Therefore, no impact would occur, and no mitigation is required.

Impact BI-4: Sensitive Vegetation Communities: Waters of the United States and Navigable Waters

Impact of Candlestick Point

Impact BI-4a **Construction at Candlestick Point would not 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. (Less than Significant with Mitigation) [Criterion N.c]**

As detailed in Table III.N-4 (Impacts to Wetlands and Other Jurisdictional Waters of the United States [Section 404]) and depicted in Figure III.N-5 (Impacts to Wetlands and Other Waters), through site grading, materials laydown, facilities construction, vegetation removal, and installation of shoreline treatments, Project activities at Candlestick Point would permanently impact 0.29 acre of tidal salt marsh and 4.34 acres of Section 404 “other waters”, relative to existing conditions (i.e., prior to completion of remediation efforts by the Navy). It would also temporarily impact 0.01 acre of tidal salt marsh and

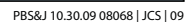
⁷⁸⁹ Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

Table III.N-4 Impacts to Wetlands and Other Jurisdictional Waters of the United States (Section 404)

Jurisdictional Feature (Waters of the United States)	Area					Yosemite Slough							
	Candlestick Point		HPS Phase II			On Site			Off Site		Temporary Totals	Permanent Totals	Grand Totals ^a
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Shadow Fill	Temporary Impacts	Permanent Impacts	Shadow Fill	Temporary Impacts	Permanent Impacts			
Freshwater Wetland	—	—	<0.01 (61 sf)	0.17	—	—	—	—	—	—	<0.01 (61 sf)	0.17	0.17
Non-tidal Salt Marsh	—	—	0.09	0.06	—	—	—	—	—	—	0.09	0.06	0.15
Tidal Salt Marsh	0.01	0.29	0.01	0.08	—	—	0.01	—	<0.01 (40 sf)	0.03	0.02	0.41	0.43
“Other Waters”	0.64	4.34	0.85	20.26	0.08	0.53	0.17	0.96	0.75	0.19	2.77	24.96	27.73
Totals for Impacted Section 404 Jurisdictional Features	0.65	4.63	0.95	20.57	0.08	0.53	0.18	0.96	0.75	0.22	2.88	25.60	28.48

SOURCES: H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California*, February 2009 and revised July 13 and October 13, 2009.
MACTEC, *Work Program for the Construction of the Yosemite Slough Bridge Corridor*, May 2009.

a. Totals may not add up due to rounding.



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0.64 acre of Section 404 “other waters”, relative to existing conditions. Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace those habitats in the same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

Shoreline improvements at Candlestick Point would result in the removal of approximately 2.86 acres of fill, and the placement of approximately 3.46 acres of fill. A net decrease of approximately 0.42 acre of open waters would occur at Candlestick Point. These impacts would occur entirely along the Candlestick Point shoreline as a result of construction of revetments to minimize flooding and shoreline erosion, and as a result of the placement of soils or sand to enhance beach or marsh habitat. For example, along most of the northern and southern edges of Candlestick Point, marsh soils would be placed in jurisdictional areas following completion of the revetment to provide a gentler slope than is currently present, which would allow for colonization by marsh vegetation. As a result, much of the fill of jurisdictional areas (as reflected in Table III.N-4 and Figure III.N-5) would result in an enhancement of habitat and, thus, would be self-mitigating.

In addition to the direct removal of wetlands and other waters, construction in or adjacent to the Bay in the wetlands could also result in indirect impacts such as increased erosion and sedimentation into and hydrologic disruption of wetlands and jurisdictional waters, decreased water quality from construction runoff and potential construction contaminants including oil, grease and fuel, and temporary decrease in habitat functions and values through hydrological disruption or elevated disturbance. However, construction of shoreline revetments would reduce erosion and turbidity in the long term by addressing existing problems with shoreline erosion.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands and other waters that would result in a net loss of these areas would be considered a significant impact. However, any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbor's Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Additionally, runoff produced during and after construction is subject to National Pollution Discharge Elimination System (NPDES) Regulations and local water quality and runoff standards.

To reduce impacts to wetlands and jurisdictional waters, the following mitigation measures shall be implemented:

MM BI-4a.1 Wetlands and Jurisdictional/Regulated Waters Mitigation for Temporary and/or Permanent Impacts. Wetlands and jurisdictional waters shall be avoided to the maximum extent practicable for all Project components. For example, any measures taken to improve the existing shoreline of Candlestick Point or HPS Phase II for purposes of flood control, erosion control, or repair or stabilization of existing structures shall minimize the amount of fill to be placed in jurisdictional areas.

Where avoidance of existing wetlands and drainages is not feasible, and before any construction activities are initiated in jurisdictional areas, the Applicant shall obtain the following permits, as applicable to the activities in question:

- *CWA Section 404 permit from the USACE.*
- *Section 10 Rivers and Harbors Act Permit from the USACE.*
- *CWA Section 401 water quality certification from the RWQCB, and/or Report of Waste Discharge for Waters of the State.*
- *CWA Section 402/National Pollution Discharge Elimination System permit from SWRCB [requiring preparation of a Stormwater Pollution Prevention Plan (SWPPP)].*
- *CDFG Section 1602 streambed alteration agreement from CDFG.*
- *A permit from the BCDC.*
- *Dredging permits from the USACE and BCDC as required, obtained through the Dredged Material Management Office (DMMO) process.*

Copies of these permits shall be provided to the contractor, along with the construction specifications. The Project Applicant shall be responsible for complying with all of the conditions set forth in these permits, including any financial responsibilities.

Compensation for impacts to wetlands and jurisdictional waters shall be required to mitigate any permanent impacts to these habitats to less-than significant-levels. Such mitigation shall also be developed (separately from the CEQA process) as a part of the permitting process with the USACE, or for non-USACE-jurisdictional wetlands, during permitting through the SFRWQCB, BCDC, and/or CDFG. The exact mitigation ratio shall be established during the permitting process, and depends on a number of factors, including the type and value of the wetlands permanently affected by the Project; however, mitigation shall be provided at a ratio of no less than 1:1 (at least 1 acre of mitigation for every 1 acre of waters of the US/ State permanently filled). Mitigation could be achieved through a combination of on-site restoration or creation of wetlands or aquatic habitats (including removal of on-site fill or structures such as piers, resulting in a gain of wetland or aquatic habitats); off-site restoration/creation; and/or mitigation credits purchased at mitigation banks within the San Francisco Bay Region. However, any mitigation for impacts to jurisdictional waters providing habitat for special-status fish such as the green sturgeon, Central California Coast steelhead, Chinook salmon, and longfin smelt must result in the restoration or creation (at a minimum 1:1 ratio) of suitable habitat for these species, and any mitigation for impacts to jurisdictional wetlands or other waters that are considered EFH by the NMFS must result in the restoration or creation (at a minimum 1:1 ratio) of EFH. Suitably planned mitigation sites may satisfy mitigation requirements for jurisdictional areas, special-status fish, and EFH simultaneously (i.e., in the same mitigation areas) if the mitigation satisfies all these needs.

For funding of off-site improvements or purchase of mitigation bank credits, the Project Applicant shall provide written evidence to the City/Agency that either (a) compensation has been established through the purchase of a sufficient number of mitigation credits to satisfy the mitigation acreage requirements of the Project activity, or (b) funds sufficient for the restoration of the mitigation acreage requirements of the Project activity have been paid to the BCDC, CCC, or other entity or agency that offers mitigation credits in the San Francisco Bay Area.

For areas to be restored, to mitigate for temporary or permanent impacts, the Project Applicant shall prepare and implement a Wetland and Jurisdictional Waters Mitigation Monitoring Plan (Mitigation Monitoring Plan). The Plan shall be submitted to the regulatory agencies along with permit application materials for approval, along with a copy to the City/Agency.

The Project Applicant shall retain a restoration ecologist or wetland biologist to develop the Wetland and Jurisdictional Waters Mitigation and Monitoring Plan, and it shall contain the following components (or as otherwise modified by regulatory agency permitting conditions):

- 1. Summary of habitat impacts and proposed mitigation ratios, along with a description of any other mitigation strategies used to achieve the overall mitigation ratios, such as funding of off-site improvements and/or purchase of mitigation bank credits*
- 2. Goal of the restoration to achieve no net loss of habitat functions and values*
- 3. Location of mitigation site(s) and description of existing site conditions*
- 4. Mitigation design:*
 - > Existing and proposed site hydrology*
 - > Grading plan if appropriate, including bank stabilization or other site stabilization features*
 - > Soil amendments and other site preparation elements as appropriate*
 - > Planting plan*
 - > Irrigation and maintenance plan*
 - > Remedial measures/adaptive management, etc.*
- 5. Monitoring plan (including final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.)*
- 6. Contingency plan for mitigation elements that do not meet performance or final success criteria.*

Restoration and/or creation of wetlands or aquatic habitats could occur on site or off site and at one or more locations, as approved by the regulatory agencies. Impacts occurring due to activities on Candlestick Point may be mitigated by restoration or creation activities on HPS Phase II and vice versa. For example, loss of open water habitat that might result from construction of shoreline treatments could potentially be mitigated by the removal of fill or structures from aquatic habitat on HPS Phase II.

The Project Applicant, or its agent, shall implement the Wetland and Jurisdictional Waters Mitigation Monitoring Plan. At least five years of monitoring (or more if required as a condition of the permits) shall be conducted to document whether the success criteria (that are determined as part of the mitigation plan) are achieved, and to identify any remedial actions that must be taken if the identified success criteria are not met. Annual monitoring reports (described below) shall be submitted to CDFG, the USACE, the BCDC, the City/Agency, and the SFRWQCB. Each report shall summarize data collected during the monitoring period, describe how the habitats are progressing in terms of the success criteria, and discuss any remedial actions performed. Additional reporting requirements imposed by permit conditions shall be incorporated into the Wetland and Jurisdictional Waters Mitigation Monitoring Plan and implemented.

Success criteria for specified years of monitoring for vegetated mitigation wetlands are as follows (though these may be subject to change pending development of specific Mitigation and Monitoring Plans and consultation during the permit process):

- *Year 1 after restored areas reach elevations suitable for colonization by wetland plants: 10 percent combined area and basal cover (rhizomatous turf) of all vegetation in the preserve wetland; at least two hydrophytic plants co-dominant with whatever other vegetative cover exists.*
- *Year 3 after restored areas reach colonization elevation: 50 percent combined area and basal cover (rhizomatous turf) of all vegetation; prevalence of hydrophytic species in terms of both cover and*

dominant species composition of the vegetation; native vascular species shall comprise 40 percent of the vegetation in the preserve wetland.

- *Year 5 after restored areas reach colonization elevation: 70 percent combined area and basal cover (rhizomatous turf) of all vegetation; more than 50 percent dominance in terms of both cover and species composition of facultative (FAC), facultative wetland (FACW), and obligate (OBL) species; native vascular species shall comprise 65 percent of the vegetation in the preserve wetlands.*

Other success criteria shall be developed for open water/mud flat habitats (which would not be expected to support vegetation) or for wetland complexes specifically designed to contain extensive areas of channels, pannes, or flats that would not be vegetated. In addition, the final Project design shall avoid substantial adverse effects to the pre-Project hydrology, water quality, or water quantity in any wetland that is to be retained on site. This shall be accomplished by avoiding or repairing any disturbance to the hydrologic conditions supporting these wetlands, as verified through an on-site Wetland Protection Plan that shall be prepared by a restoration ecologist or wetland biologist that is retained by the Project Applicant, and submitted to regulatory agencies for approval, along with a copy to the City/Agency. If such indirect effects cannot be avoided, compensatory mitigation shall be provided for the indirectly affected wetlands at a minimum 1:1 ratio, as described above. Mitigation for indirectly impacted wetlands shall be described in the Wetland and Jurisdictional Waters Mitigation and Monitoring Plan.

Project features resulting in impacts to open water areas as a result of the marina, bridge, and breakwater construction shall be designed to be the minimum size required to meet their designated need. The opening in the breakwater shall be large enough and positioned such that it would allow for a complete daily exchange of water within the marina that would otherwise result from normal tidal flow, as determined by a coastal engineer and an aquatic biologist. This opening shall be designed to minimize disruption to the local hydrology generated by the breakwater and allow for normal tidal flow to ensure the daily exchange of nutrients.

MM BI-4a.2

Wetlands and Jurisdictional/Regulated Waters Impact Minimization for Construction-Related Impacts. *The Project Applicant shall ensure that the contractor minimizes indirect construction-related impacts on wetlands and jurisdictional/regulated waters throughout the Study Area by implementing the following Best Management Practices (BMPs):*

- *Prior to any construction activities on the site, a protective fence shall be installed a minimum of one foot (or greater, if feasible) from the edge of all wetland habitat to be avoided in the immediate vicinity of the proposed construction areas. Prior to initiation of construction activities, a qualified biologist shall inspect the protective fencing to ensure that all wetland features have been appropriately protected. No encroachment into fenced areas shall be permitted during construction and the fence shall remain in place until all construction activities within 50 feet of the protected feature have been completed.*
- *Construction inspectors shall routinely inspect protected areas to ensure that protective measures remain in place and effective until all construction activities near the protected resource have been completed. The fencing shall be removed immediately following construction activities.*
- *To maintain hydrologic connections, the Project design shall include culverts for all seasonal and perennial drainages that are waters of the United States and/or Waters of the State.*
- *Sediment mitigation measures shall be in place prior to the onset of Project construction and shall be monitored and maintained until construction activities have been completed. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas. Excess excavated soil shall be disposed of at a regional landfill or at another approved*

and/or properly permitted location. Stockpiles that are to remain on the site throughout the wet season shall be protected to prevent erosion.

- *Where determined necessary by regulatory agencies, geotextile cushions and other appropriate materials (i.e., timber pads, prefabricated equipment pads, geotextile fabric) shall be used in saturated conditions to minimize damage to the substrate and vegetation.*
- *Exposed slopes and banks shall be stabilized immediately following completion of construction activities to reduce the effects of erosion on the drainage system.*
- *In highly erodible areas, such as Yosemite Slough, banks shall be stabilized using a non-vegetative material that shall bind the soil initially and break down within a few years. If, during review of the grading permit for this area, the City/Agency determines that more aggressive erosion control treatments are needed, the contractor shall be directed to use geotextile mats, excelsior blankets, or other soil stabilization products.*
- *The contractors shall develop a Storm Water Pollution Prevention Plan (SWPPP) prior to construction. As discussed in the Regulatory Framework of the Hydrology and Water Quality section of this EIR, the SWPPP will comply with applicable local, state, and federal requirements. Erosion control BMPs may include, but are not limited to, the application of straw mulch; seeding with fast growing grasses; construction of berms, silt fences, hay bale dikes, stormwater detention basins, and other energy dissipaters. BMPs shall be selected and implemented to ensure that contaminants are prevented from entering the San Francisco Bay during construction and operation of the facilities shall protect water quality and the marine species in accordance with all regulatory standards and requirements.*
- *Testing and disposal of any dredged sediment shall be conducted as required by the USACE and the Long-Term Management Strategy (LTMS)⁷⁹⁰*
- *For impacts to tidal habitats:*
 - > *Conduct all work in dewatered work areas*
 - > *Install sediment curtains around the worksite to minimize sediment transport*
 - > *Work only during periods of slack, tide (minimal current) and low wind to minimize transport of sediment laden water*

Implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. Consequently, implementation of these mitigation measures would reduce potential adverse effects to wetlands and jurisdictional waters to less-than-significant levels.

⁷⁹⁰ US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001.

Impact of Hunters Point Shipyard Phase II

Impact BI-4b **Construction at HPS Phase II would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) [*Criterion N.c*]**

As detailed in Table III.N-4 and depicted in Figure III.N-5, through site grading, materials laydown, facilities construction, vegetation removal, installation of shoreline treatments, and construction of the marina, Project activities at HPS Phase II would permanently impact existing wetlands and other waters as follows: 0.17 acre of nontidal freshwater wetland, 0.08 acre of tidal salt marsh, 0.06 acre of non-tidal salt marsh, and 20.26 acres of Section 404 other waters. It would also temporarily impact 0.01 acre of tidal salt marsh, 0.09 acre of nontidal salt marsh, less than 0.01 acre of freshwater wetland, and 0.85 acre of Section 404 other waters. Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace them in the same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

For the purpose of discussing all project activities that could affect aquatic habitats, impacts to open waters that will result from the removal of existing structures (such as pier headwalls) are considered permanent impacts, since there will be some fill placed within the new open water/intertidal habitat for slope stabilization or restoration purposes after the existing structures are removed. However, such an approach to impact estimation is very conservative, as these activities will result in ecological enhancements by creating new aquatic habitat where none currently exists. As discussed in greater detail below, nearly 10 acres of the total 21.52 acres of impacts to jurisdictional areas on HPS Phase II would result from activities that would enhance ecological conditions along the HPS shoreline.

As mentioned for Candlestick Point above, the impact to tidal salt marsh, Section 404 other waters along the southern shoreline of HPS would occur primarily as a result of the placement of soils along the shoreline to enhance marsh habitat. Following the completion of a revetment by the Navy, the Project Applicant would enhance the revetment as needed (e.g., for aesthetics or to allow it to be more easily raised in the event of sea level rise). However, work to enhance the revetment simply for improved flood control or aesthetics is not expected to result in additional impacts to jurisdictional areas. Rather, the CP/HPS Project would add soil or other materials on the outboard side of the revetment to facilitate the creation of tidal salt marsh in several areas along the southern shoreline of HPS by reducing the revetment's slope and providing a more suitable substrate for colonization by wetland vegetation. As a result, most of the fill of jurisdictional areas (as reflected in Table III.N-4 and Figure III.N-5) along the southern shoreline of HPS (about 1.9 acres of the total acreage impacted at HPS) would result in an enhancement of habitat and, thus, would be self-mitigating.

It is possible that the Yosemite Slough Bridge and its approaches may be constructed before the Navy has completed remediation efforts (including mitigation for its impacts to wetlands) on Parcel E-2. In that case, construction of the bridge and its approaches would impact whatever wetlands have not yet been disturbed, or created, by the Navy, which may include some of the wetlands in the southwestern portion of Parcel E-2 that are included in Table III.N-4 and shown in Figure III.N-5. However, the majority of the non-tidal salt marsh in the southwestern portion of Parcel E-2 would not be impacted by

the CP/HPS Project, whether the Navy has completed its remediation efforts or not. If the Navy completes its remediation and construction of its mitigation wetlands before the bridge and its approaches are constructed, then virtually all of the currently existing wetlands on Parcels E and E-2 (including the approximately 1.8 acres of nontidal wetlands not affected by the Project) would have been impacted by the Navy's work prior to CP/HPS Project construction. A wetland mitigation site, consisting of a tidal and non-tidal component, has been proposed by the Navy on the southwestern corner of Parcel E-2 (refer to Figure III.N-6 [Proposed HPS Phase II Wetlands]). Portions of this proposed mitigation site cannot be avoided during construction of the bridge and its approaches. Thus, if the Navy's mitigation were constructed in the proposed locations, the bridge and roadway right-of-way would permanently impact approximately 0.0992 acre and temporarily impact 0.1532 acre of wetlands on this mitigation site. The remainder of the mitigation site would not be impacted by the CP/HPS Project, but rather would be preserved and incorporated into the Project area.

Of the 21.52 acres of total impacts to jurisdictional wetlands and other waters of the US that would occur on HPS Phase II, jurisdictional areas that would be completely lost (i.e., converted to non-jurisdictional habitats) total only 2.56 acres. This loss of habitat would occur due to construction of the northern abutment of the Yosemite Slough bridge, along the approach road to the bridge, where a freshwater wetland is located in the west-central part of the site, and where construction of new breakwaters, a floating dock, and a gangway would be placed in the marina. Of the remaining impacts, approximately 8.96 acres would result from fill placed for drydock repairs, buttressing required to support existing pier walls and bulkheads, or other shoreline improvements.

The Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and placement or replacement of fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately 8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS is responsible for approximately 1.9 acres of impacts, nearly 10 acres of the total 21.52 acres of impacts to jurisdictional areas on HPS Phase II would result from activities that would enhance ecological conditions along the HPS shoreline.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands that would result in a net loss of these areas would be considered a substantial adverse effect. In addition, removal of an established mitigation site would also be considered a substantial adverse effect. However, prior to any grading or construction that may impact jurisdictional area(s), any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbors Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Additionally, runoff produced during and after construction is subject to NPDES and local water quality and runoff standards. Lastly, mitigation measures MM BI-4a.1 and



FIGURE III N-6  **Candlestick Point - Hunters Point Shipyard Phase II EIR**
PROPOSED HPS PHASE II WETLANDS

MM BI-4a.2 (first discussed in Impact BI-4a) would be implemented to reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to on waters of the United States, including wetlands and navigable waters. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact of Yosemite Slough Bridge

Impact BI-4c Construction of the Yosemite Slough bridge would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) [*Criterion N.c*]

The new Yosemite Slough bridge would be a nine-span steel-beam bridge as shown on the MACTEC Engineering and Consulting preliminary draft drawings titled “Yosemite Slough Bridge” (Appendix N2).⁷⁹¹ These plans indicate that the bridge would be approximately 81 feet wide and 902 feet long, and would be supported by 20 steel-pile supported columns and 12 bedrock-supported columns.

As detailed in Table III.N-4 and depicted in Figure III.N-5, bridge construction equipment and materials would be staged at the site in designated lay down areas. Construction access and dewatering would result in temporary impacts to 0.53 acre of Section 404 other waters. It would also result in permanent impacts to 0.01 acre of tidal salt marsh, and 0.17 acre of Section 404 other waters.⁷⁹² Construction of the piers’ pilings would require the excavation of approximately 2,400 cubic yards of material from the slough; 167 cubic yards of material would be excavated from jurisdictional areas for construction of abutments and installation of riprap at the toe of the north and south bridge abutments.⁷⁹³

Temporary off-site impacts (i.e., in portions of Yosemite Slough outside the Project boundary) from construction include less than 0.01 acre of tidal salt marsh, and 0.75 acre of Section 404 other waters. Permanent off-site impacts from construction include 0.03 acre of tidal salt marsh and 0.19 acre of Section 404 other waters. In addition to solid material placed within the Bay, the BCDC considers structures suspended above the Bay or floating on the water to be “fill” and subject to their regulation. The “shadow fill” produced by the Yosemite Slough bridge may change the biological functions and values of aquatic and mud flat habitats below to some extent; such an impact would cover approximately 0.96 acre based on the acreage of mudflat below the immediate bridge surface. Shadow fill would not result in the complete loss of functions and values of the aquatic habitats below, however, and many fish and aquatic organisms would continue to use these areas following bridge construction.

⁷⁹¹ MACTEC. Preliminary Draft: Yosemite Slough Bridge, Sheets 1-7, October 2009, which is provided as Appendix N2 to this EIR.

⁷⁹² Ibid.

⁷⁹³ Ibid.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands that would result in a net loss of these areas would be considered a significant impact. However, any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbors Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Additionally, runoff produced during and after construction is subject to NPDES and local water quality and runoff standard.

Mitigation measure MM BI-4a.1 shall be implemented to compensate for the loss of wetlands and other jurisdictional waters resulting from the Yosemite Slough bridge. For example, permanent fill of such habitats would be compensated by creation or restoration of jurisdictional habitats on or off site, and/or by the purchase of credits in a mitigation bank; such compensation would be performed in conjunction with compensation for impacts to jurisdictional areas on Candlestick Point and HPS. Any vegetated wetlands that are permanently impacted by shading from the bridge would be mitigated in this manner since shading may inhibit vegetation colonization under the bridge after construction is complete. However, shading of 0.94 acre of mud flats and aquatic habitats would have only moderate effects on the functions and values of these habitats and would not result in the loss of these habitats. Mitigation measure MM BI-4a.2 shall be implemented to minimize indirect construction-related impacts on wetlands and other jurisdictional waters. Further, shading impacts to mud flats and aquatic habitats would be reduced by implementation of mitigation measure MM BI-4c.

MM BI-4c Mitigation for Shading Impacts to Jurisdictional/Regulated Waters. Mud flats and aquatic habitats impacted by permanent shading from the Yosemite Slough bridge shall be mitigated by the creation or restoration, either on site, off site, and/or via purchase of mitigation bank credits, at a 0.5:1 (mitigation:impacted) ratio. Aside from the mitigation ratio, such mitigation shall be provided as described for mitigation measure MM BI-4a.1.

Mitigation measures MM BI-4a.1 and MM BI-4a.2 (first discussed in Impact BI-4a) would be implemented to reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to on waters of the United States, including wetlands and navigable waters. In addition, implementation of mitigation measure MM BI-4c would mitigate the impacts of shadow fill to mud flats and aquatic habitats as a result of construction of Yosemite Slough bridge. Consequently, implementation of mitigation measures MM BI-4a.1, MM BI-4a.2, and MM BI-4c would fully mitigate for the temporary and permanent loss of wetlands and jurisdictional waters, and adverse effects would be less than significant.

Impact BI-5: Sensitive Vegetation Communities: Eelgrass Beds

Impact of Candlestick Point

Impact BI-5a Construction at Candlestick Point would not have a substantial adverse effect on eelgrass beds, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (No Impact) [*Criterion N.b*]

Development at Candlestick Point would require minor in-water work associated with construction of the shoreline treatments. The distribution of eelgrass has been mapped recently and the results of this effort indicate that no eelgrass beds are found in the near-shore waters of the Candlestick Point peninsula.⁷⁹⁴ Therefore, construction activities at Candlestick Point would have no impact on this sensitive resource. No mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-5b Construction at HPS Phase II would not have a substantial adverse effect on eelgrass beds, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation) [*Criterion N.b*]

Within HPS Phase II a total of 1.99 acres of eelgrass occurs at two locations (refer to Figure III.N-2). A small eelgrass occurrence was reported along the north shore of the South Basin directly across from Candlestick Point.⁷⁹⁵ The only other reported occurrence of eelgrass within HPS Phase II is on the north shore, east of the northern end of Earl Street.⁷⁹⁶ This eelgrass bed extends from the end of Earl Street to the pier that forms Drydock 5. These eelgrass beds are mapped as being below mean sea level and, therefore, are spatially separated from areas where shoreline treatments would occur. There are no mapped eelgrass beds where the marina improvements would occur or where the Yosemite Slough bridge would be constructed.

The shoreline improvements associated with HPS Phase II include transforming the revetment edge in wave-protected reaches to a more natural looking shoreline by placing suitable fill to cover the revetment that would be constructed by the Navy, which may include Articulated Concrete Block (ACB) mats and/or marsh soils. Shoreline wave berms may be included along the southwest facing shoreline at the bayward end of the ACB mats. If wave berms or other shoreline improvements were constructed in either of the two areas where eelgrass beds are known to exist, they could directly impact them through excavation/removal or placement of fill material. Construction of these features or other shoreline treatments near eelgrass beds could also result in the mobilization of some sediment, which, if it were to settle out on eelgrass, could reduce photosynthesis and, therefore, productivity and survival. Because of the ecological importance but regional scarcity of eelgrass beds and the potential contribution of eelgrass beds in the Study Area to populations of aquatic species (and their predators) throughout larger portions

⁷⁹⁴ San Francisco Bay Eelgrass Inventory, June-October 2003. Prepared for Caltrans and NOAA Fisheries. Prepared by Merkel and Associates, 2003.

⁷⁹⁵ Ibid.

⁷⁹⁶ Ibid.

of the Bay, any impacts would be considered a substantial reduction in the local population and, therefore, a substantial adverse effect.

To reduce this impact, the following mitigation measures shall be implemented.

MM BI-5b.1 *Avoidance of Impacts to Eelgrass. As the design of shoreline treatments progresses, and a specific Shoreline Treatment Plan is determined, the Plan shall minimize any in-water construction required for installation of any treatment measures near either of the two eelgrass locations noted above. If in-water work is completely avoided within 750 feet of these areas, there would be no impact and no further mitigation would be required. If complete avoidance of work within 750 feet of these areas is not feasible, measure MM BI-5b.2 shall be implemented.*

MM BI-5b.2 *Eelgrass Survey. If avoidance of work within 750 feet of two known eelgrass locations is not feasible, an update to the existing eelgrass mapping shall be conducted to determine the precise locations of the eelgrass beds. This survey shall occur when a final Shoreline Treatment Plan has been prepared. The survey shall be conducted by a biologist(s) familiar with eelgrass identification and ecology and approved by NMFS to conduct such a survey. The area to be surveyed shall encompass the mapped eelgrass beds, plus a buffer of 750 feet. Survey methods shall employ either SCUBA or sufficient grab samples to ensure that the bottom was adequately inventoried. The survey shall occur between August and October and collect data on eelgrass distribution, density, and depth of occurrence for the survey areas. The edges of the eelgrass beds shall be mapped. At the conclusion of the survey a report shall be prepared documenting the survey methods, results, and eelgrass distribution within the survey area. This report shall be submitted to NMFS for approval. The survey data shall feed back into the shoreline treatment design process so that Project engineers can redesign the treatments to avoid or minimize any direct impacts to eelgrass beds.*

If the shoreline treatments can be adjusted so that no direct impacts to eelgrass beds would occur, no further mitigation under this measure would be required. Management of water quality concerns is addressed through mitigation measure MM BI-5b.4 and shall be required to minimize sediment accumulation on the eelgrass. If direct impacts to eelgrass beds cannot be avoided, mitigation measure MM BI-5b.3 shall be implemented.

MM BI-5b.3 *Compensatory Eelgrass Mitigation. If direct impacts to eelgrass beds cannot be avoided, compensatory mitigation shall be provided in conformance with the Southern California Eelgrass Mitigation Policy. Mitigation shall entail the replacement of impacted eelgrass at a 3:1 (mitigation:impact) ratio on an acreage basis, based on the eelgrass mapping described in mitigation measure MM BI-5b.2 and detailed designs of the feature(s) that would impact eelgrass beds. Such mitigation could occur either off site or on site.⁷⁹⁷ Off-site mitigation could be achieved through distribution of a sufficient amount of funding to allow restoration or enhancement of eelgrass beds at another location in the Bay. If this option is selected, all funds shall be distributed to the appropriate state or federal agency or restoration-focused non-governmental agency (i.e., CDFG restoration fund, California Coastal Conservancy, Save the Bay, etc). The Project Applicant shall provide written evidence to the City/Agency that either a) compensation has been established through the purchase of a sufficient number of mitigation credits to satisfy the mitigation acreage requirements of the Project activity, or b) funds sufficient for the restoration of the mitigation acreage requirements of the Project activity have been paid. These funds shall be applied only to eelgrass restoration within the Bay.*

⁷⁹⁷ NMFS, Southwest Regional Office, Southern California Eelgrass Mitigation Policy, as revised August 30, 2005. Website: http://swr.nmfs.noaa.gov/hcd/policies/EELPOLrev11_final.pdf. Accessed July 20, 2009.

If on-site mitigation is selected as the appropriate option, the Project Applicant shall retain a qualified biologist familiar with eelgrass ecology (as approved by the City/Agency) to prepare and implement a detailed Eelgrass Mitigation Plan. Unless otherwise directed by NMFS, the Eelgrass Mitigation Plan shall follow the basic outline and contain all the components required of the Southern California Eelgrass Mitigation Policy (as revised in 2005),⁷⁹⁸ including: identification of the mitigation need, site, transplant methodology, mitigation extent (typically 3:1 on an acreage basis⁷⁹⁹), monitoring protocols (including frequency, staffing, reviewing agencies, duration, etc), and success criteria. A draft Eelgrass Mitigation Plan shall be submitted to NMFS, for its review and approval prior to implementation, with a copy to the City/Agency. Once the plan has been approved, it shall be implemented in the following appropriate season for transplantation. Restored eelgrass beds shall be monitored for success over a 5-year period.

MM BI-5b.4 Eelgrass Water Quality BMPs. *To prevent sediment that could be suspended during construction from settling out onto eelgrass, for any shoreline treatments within 750 feet of identified eelgrass beds, the Project Applicant shall require the selected contractor to implement appropriate BMPs that could include any or all of the following options, or others deemed appropriate by NMFS:*

- 1. Conduct all work in dewatered work areas*
- 2. Conduct all in-water work during periods of eelgrass dormancy (November 1-March 31)*
- 3. Install sediment curtains around the worksite to minimize sediment transport*
- 4. Work only during periods of slack tide (minimal current) and low wind to minimize transport of sediment laden water*

Implementation of mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects of shoreline treatments on eelgrass by avoiding impacts through initial design if feasible; determining the locations of eelgrass beds through surveys; using survey data to refine shoreline treatments to further avoid or minimize impacts to eelgrass; and compensating for unavoidable impacts through the creation or restoration of eelgrass beds at a 3:1 ratio, thus replacing impacted habitat and increasing its abundance regionally. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

⁷⁹⁸ NMFS, Southwest Regional Office, Southern California Eelgrass Mitigation Policy, as revised August 30, 2005. Website: http://swr.nmfs.noaa.gov/hcd/policies/EELPOLrev11_final.pdf. Accessed July 20, 2009.

⁷⁹⁹ US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001; Appendix F – ESA and EFH Consultation.

Impact BI-6: Birds

Impact of Candlestick Point

Impact BI-6a **Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation) [Criterion N.a]**

Special-status avian species (as defined in the Setting portion of this section) for which suitable habitat is present on site, and that have a “low” or better potential to occur, include the Alameda song sparrow, American peregrine falcon, burrowing owl, Bryant’s savannah sparrow, California brown pelican, loggerhead shrike, northern harrier, San Francisco common yellowthroat, short-eared owl, tricolored blackbird, and white-tailed kite (refer to Table III.N-5). Some of these species have never nested on the Project site and are not expected to nest here due to the absence of suitable nesting habitat, human disturbance, or predation risk; such species include the California brown pelican, northern harrier, short-eared owl, and tricolored blackbird. Of the remaining species, only the American peregrine falcon has been confirmed breeding on the site; operational impacts to this species are discussed in Impact BI-16 below. For reasons described previously, there is a low probability that the Alameda song sparrow, burrowing owl, Bryant’s savannah sparrow, loggerhead shrike, San Francisco common yellowthroat, and white-tailed kite currently breed here. Nevertheless, if any of these special-status species nests on the site, there is some potential that active nests, including eggs or young, could be destroyed by vegetation removal, grading, or other Project activities, or that Project activities could disturb nesting adults to the point of nest abandonment, causing the loss of eggs or young.

In addition to recognized special-status species, as discussed above in Regulatory Framework, all native bird species that may use the site are protected under the MBTA and *California Fish and Game Code*. These laws protect many common species in addition to those considered special-status species.

It is unlikely that construction activities would result in the loss of free-flying birds (though see Impact BI-20a for a discussion of potential bird-strike issues associated with bright lights or tall buildings). However, Project implementation and construction-related activities including, but not limited to, grading, materials laydown, facilities construction, vegetation removal, and construction vehicle traffic may result in loss of a special-status and/or legally protected avian species’ active nest and/or mortality of the nest’s occupants. Due to the relatively low regional populations of any special-status species that might nest on the site, the loss of active nests of a special-status bird would be significant. Although most other, non-special-status birds that may nest on the site are more common regionally, and the Project would provide a net benefit to many protected bird species, including breeding, migrant, and wintering birds, as a result of habitat enhancements, impacts to active nests of any native bird would be considered significant due to these species’ protection by the MBTA and *California Fish and Game Code*.

To reduce these impacts the following mitigation measures would be implemented:

MM BI-6a.1

Impact Avoidance and Pre-Construction Surveys for Nesting Special-Status and Legally Protected Avian Species. The following measures shall be implemented by the Project Applicant to avoid impacts to nesting birds.

1. Not more than 15 days prior to construction activities that occur between February 1 and August 31, surveys for nesting birds shall be conducted by a qualified biologist (one familiar with the breeding biology and nesting habits of birds that may breed in the Project vicinity) that is selected by the Project Applicant, and approved by the City/Agency. Surveys shall cover the entire area to be affected by construction and the area within a 250-foot buffer of construction or ground-disturbing activities. The results of the surveys, including survey dates, times, methods, species observed, and a map of any discovered nests, shall be submitted to the City/Agency. If no active avian nests (i.e. nests with eggs or young) are identified on or within 250 feet of the limits of the disturbance area, no further mitigation is necessary. Phased construction work shall require additional surveys if vegetation or building removal has not occurred within 15 days of the initial survey or is planned for an area that was not previously surveyed. Alternatively, to avoid impacts, the Project Applicant shall begin construction after the previous breeding season for local raptors and other special-status species has ended (after August 31) and before the next breeding season begins (before February 1).
2. If active nests (with eggs or young) of special-status or protected avian species are found within 250 feet of the proposed disturbance area, a minimum 250-foot no-disturbance buffer zone surrounding active raptor nests and a minimum 100-foot buffer zone surrounding nests of other special-status or protected avian species shall be established until the young have fledged. Project activities shall not occur within the buffer as long as the nest is active. The size of the buffer area may be reduced if a qualified biologist familiar with the species' nesting biology (as approved by the City/Agency) and CDFG determine it would not be likely to have adverse effects on the particular species. Alternatively, certain activities may occur within the aforementioned buffers, with CDFG concurrence, if a qualified biologist monitors the activity of nesting birds for signs of agitation while those activities are being performed. If the birds show signs of agitation suggesting that they could abandon the nest, activities would cease within the buffer area. No action other than avoidance shall be taken without CDFG consultation.
3. Completion of the nesting cycle (to determine when construction near the nest can commence) shall be determined by a qualified biologist experienced in identification and biology of the specific special-status or protected species.

MM BI-6a.2

Burrowing Owl Protocol Surveys and Mitigation. Because burrowing owls may take refuge in burrows any time of year, species-specific measures are necessary to avoid take of this species. The following measures shall be undertaken by the Project Applicant to protect burrowing owls.

Prior to construction activities, focused pre-construction surveys shall be conducted for burrowing owls where suitable habitat is present within the construction areas. Surveys shall be conducted by a qualified biologist (i.e., one who is familiar with burrowing owl ecology and experienced in performing surveys for them, as approved by the City/Agency) no more than 30 days prior to commencement of construction activities. These surveys shall be conducted in accordance with the burrowing owl survey protocol contained within California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines, or any more current equivalent should new guidelines be released before construction.

1. If no occupied burrows are found in the survey area, a letter report documenting survey methods and findings shall be submitted to the City/Agency and CDFG, and no further mitigation is necessary.

2. *If unoccupied burrows are found during the non-breeding season, prior to construction activities, the Project Applicant shall collapse the unoccupied burrows, or otherwise obstruct their entrances to prevent owls from entering and nesting in the burrows. This measure would prevent inadvertent impacts during construction activities.*
3. *If occupied burrows are found, a letter report documenting survey methods and findings (including a map showing the locations of the occupied burrows) shall be submitted to the City/Agency and CDFG. Impacts to the burrows shall be avoided by providing a construction-free buffer of 250 feet during the nesting season (February 1 through August 31). A buffer of 165 feet from the active burrows should be provided during the non-breeding season (September 1 through January 31) if feasible, though a reduced buffer is acceptable during the non-breeding season as long as construction avoids direct impacts to the burrow(s) used by the owls. The size of the buffer area may be reduced if the CDFG determines it would not be likely to have adverse effects on the owls. No Project activity shall commence within the buffer area until a qualified biologist (as approved by the City/Agency) confirms that the burrow is no longer occupied. If the burrow is occupied by a nesting pair, as recommended by the California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines, a minimum of 6.5 acres of foraging habitat contiguous (immediately adjacent) to the burrow shall be maintained until the nesting season is over. If the foraging habitat contiguous to the occupied burrow is currently less than 6.5 acres, the entire foraging habitat shall be maintained until the nesting season is over.*
4. *If impacts to occupied burrows are unavoidable, passive relocation techniques approved by CDFG shall be used to evict owls from burrows within the construction area prior to construction activities. However, no occupied burrows shall be disturbed during the nesting season unless a qualified biologist (as approved by the City/Agency) verifies through non-invasive methods that juveniles from the occupied burrows are foraging independently and are capable of independent survival, or verifies the owls have not yet laid eggs. If any breeding owls must be relocated (i.e., after the nesting season has ended), mitigation of impacts to lost foraging and nesting habitat for relocated pairs shall follow guidelines provided in the California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines, which depending upon conditions detailed in the guidance (such as mitigation habitat quality), range from 7.5 to 19.5 acres per pair. This mitigation may take the form of the purchase of credits in a burrowing owl mitigation bank or the preservation and management of the required habitat acreage on site (e.g., in the Grasslands Ecology Park) or off site. If mitigation is provided via on-site or off-site habitat preservation and management, a Burrowing Owl Habitat Management Plan shall be prepared by a qualified biologist and submitted to the CDFG for review and approval, along with a copy to the City/Agency. This plan shall detail the location of the mitigation site, the means of preservation of the site (i.e., via a conservation easement), any enhancement and management measures necessary to ensure that habitat for burrowing owls is maintained in the long term, a monitoring program, and the size of an endowment established for the long-term maintenance of the site.*

Implementation of mitigation measures MM BI-6a.1 and MM BI-6a.2 would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species by surveying for, identifying, and avoiding occupied nests and delaying construction if necessary to prevent nest abandonment, and/or providing a buffer zone around occupied nests to ensure that disturbance from construction activities do not result in the loss of individuals or destruction of nests or eggs. In addition, mitigation measure MM BI-6a.2 would require focused surveys for burrowing owls and

specifies active and passive impact avoidance measures to avoid impacting this species and replace lost habitat. Specifically, if these species are identified nesting within the site, mitigation measures would implement construction buffers to protect occupied burrows, eggs, and young, as dictated by site-specific conditions in consultation with CDFG. Implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels by avoiding the loss of special-status or legally protected nesting species.

Impact of Hunters Point Shipyard Phase II

Impact BI-6b **Construction at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation) [Criterion N.a]**

Similar to development at Candlestick Point, construction-related activities including, but not limited to, grading, materials laydown, facilities construction, vegetation removal, and construction vehicle traffic may result in loss of a special-status and/or legally protected avian species' active nest and/or mortality of the nest's occupants; this would be considered a significant impact. Implementation of mitigation measures MM BI-6a.1 and MM BI-6a.2 (as detailed in Impact BI-6a) would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species to less-than-significant levels.

A resident pair of American peregrine falcons has been observed successfully nesting on the Re-gunning crane on Parcel D of HPS Phase II. The Project would not remove the Re-gunning crane on Parcel D and, therefore, would not remove the nesting site. However, construction-related activities such as noise and light generating activities may disturb peregrine nesting activities. Peregrines are a state-listed endangered species (though the California Fish and Game Commission recently voted for delisting) and fully protected under the *California Fish and Game Code*. If Project-generated disturbance is high enough, this pair of falcons could abandon the nest site entirely; due to the relatively low regional populations of this species, the loss of eggs or young due to abandonment of an active nest would be considered a substantial adverse effect and a significant impact. However, researchers at the Santa Cruz Predatory Bird Research Group^{800,801} who were contacted about this Project's potential impact to this species expressed their professional opinion that like many other raptors, these peregrine falcons are expected to continue normal nesting activities if the nest site is left alone. Mitigation measure MM BI-6b would ensure effects of Project construction to nesting peregrine falcons are reduced to a less-than-significant level by identifying active nests during pre-construction surveys, delaying construction (if necessary) to limit disturbance.

⁸⁰⁰ Glenn Stewart, Coordinator, UCSC Predatory Bird Research Group. E-mail correspondence July 13, 2009.

⁸⁰¹ The Santa Cruz Predatory Bird Research Group was founded to help restore a peregrine falcon population that had plummeted to just two known breeding pairs in California. SCPBRG conducts research to monitor and develop innovative management techniques and strategies to accelerate the recovery of peregrine falcon populations and other predatory birds.

MM BI-6b

American Peregrine Falcon Nest Protection Measures. To protect the nest of peregrine falcons during construction, the following measures shall be implemented by the Project Applicant prior to construction or other disturbance within 500 feet of the Re-gunning crane nest.

1. Not more than 30 days prior to construction activities that occur between February 1 and August 15, surveys for nesting peregrine falcons shall be conducted on the Re-gunning crane, and within a 500-foot buffer surrounding the potential nesting location. Surveys shall be performed by a qualified biologist (i.e., one familiar with falcon biology and nesting) that is selected by the Project Applicant, and approved by the City. The results of the surveys shall be submitted to the City/Agency and the CDFG. If no active peregrine falcon nests, eggs, or breeding activity, are identified on or within 500 feet of the limits of the disturbance area, no further mitigation is necessary. Alternatively, to avoid impacts, the Project Applicant can begin construction after the previous breeding season has ended (after August 31) and before the next breeding season begins (before February 1).
2. If active peregrine nests or breeding activity are observed within the survey area, a minimum 250-foot no disturbance buffer zone surrounding the nesting location shall be established until the young have fledged. Within this buffer, no Project construction activities shall occur while the nest is active. The size of the buffer area may be reduced if a qualified biologist and CDFG determine it would not be likely to have adverse effects on the falcons. No action other than avoidance shall be taken without CDFG consultation.
3. No new Project construction activity shall commence within the buffer area until young have fledged and the nest is no longer active, or until nesting has been terminated for reasons unrelated to Project activities. Completion of the nesting cycle shall be determined by a qualified biologist who is experienced in peregrine falcon breeding biology (as determined by the City/Agency).

Implementation of mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species to less-than-significant levels.

Impact BI-7: Foraging Habitat for Raptors

Impact of Candlestick Point

Impact BI-7a Construction at Candlestick Point would not have a substantial adverse effect on the quantity and quality of suitable foraging habitat for raptors. (Less than Significant) [*Criterion N.a*]

Construction on Candlestick Point would remove approximately 5.13 acres of non-native grasslands within Candlestick Point that serve as foraging habitat for grassland-associated raptors such as the red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*). Maximum counts (per survey) of eight red-tailed hawks and two American kestrels were recorded during the Yosemite Slough Watershed Wildlife surveys. Alteration of grassland habitat would also cause local reductions in habitat for prey of these raptors as well, in the areas being converted from grassland to developed uses. However, the majority of construction activities associated with Candlestick Point would not occur within grasslands and associated suitable raptor foraging habitat; rather, most of the Study Area's existing grasslands occur in areas that would not be transferred from CPSRA parkland and would, therefore, not be affected by Project activities. Therefore, adverse effects of development at Candlestick Point on raptor foraging habitat would be less than significant. No mitigation is required.

In addition, the Project's proposed ecological enhancements (as detailed in Impact BI-2), which would be refined in the Project's Draft Parks, Open Space, and Habitat Concept Plan, include measures to restore and manage areas that would be highly suitable as raptor foraging habitat. These measures would be required by MM BI-7b if this mitigation measure is adopted. The Project's enhancement of non-native grasslands that would be suitable replacement foraging habitat would, overall, be beneficial to grassland-associated raptors and more than offset any adverse effects from the removal of non-native grasslands at Candlestick Point.

Impact of Hunters Point Shipyard Phase II

Impact BI-7b Implementation of the Project at HPS Phase II would not have a substantial adverse effect on the quantity and quality of suitable foraging habitat for raptors. (Less than Significant with Mitigation) [Criterion N.a]

Project activities associated with HPS Phase II would involve the creation of a Grasslands Ecology Park on the southern portion of HPS. Landscaping associated with creation of this park would alter approximately 43 acres of non-native grasslands within the HPS Phase II that currently serve as raptor foraging areas. As historic raptor foraging areas within the City have been reduced due to the conversion of open space to urbanized environments, permanent loss of suitable foraging habitat would be considered a substantial adverse effect.

However, the Project's proposed ecological enhancements (as detailed in Impact BI-2), which would be refined in the Project's Draft Parks, Open Space, and Habitat Concept Plan, include measures to restore and manage areas that would be highly suitable as raptor foraging habitat. Specifically, the Project's impacts to 43 acres of non-native grasslands that currently serve as raptor foraging habitat would occur as a result of enhancements that would be made to create a variety of habitats, including extensive grasslands, within the Grasslands Ecology Park. At least 43 acres of the Grasslands Ecology Park would be enhanced by removal of invasive plants and restoration of native-dominated grasslands, and this area would be managed specifically for grassland-associated species. As a result, it would provide enhanced foraging opportunities for raptors and enhanced habitat for their prey when compared to the unmanaged, heavily disturbed non-native grasslands that currently occupy most portions of the HPS Phase II that are not already developed. Management of grasslands for grassland-associated prey species such as small mammals would benefit raptors such as American kestrels, red-tailed hawks, and barn owls that frequently forage in grasslands. Throughout the Project site, including parks and open space areas on both Candlestick Point and HPS Phase II, approximately 10,000 net new trees (more than four times the number currently present in the Project area) would be planted at the Project site and in the community. Many of these trees would be suitable for raptor perching, some of which would provide raptor nest sites as they mature. As discussed previously, the Project's planting of trees and shrubs would increase the abundance of smaller birds on the site, and increases in the general abundance of migratory birds as a result of shrub and tree planting would increase prey for raptors such as Cooper's hawks, sharp-shinned hawks, and merlins that specialize on birds, thus enhancing the quality of foraging habitat for these raptors. Because habitat use by red-shouldered hawks (*Buteo lineatus*) can be limited by perch availability in vast open areas, the introduction of perches by planting of trees near grasslands is expected to enhance

foraging habitat conditions on large open areas such as southern HPS Phase II, as has been documented in southern California.⁸⁰²

The Project's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b shall be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur.

MM BI-7b Enhancement of Raptor Foraging Habitat. The Draft Parks, Open Space, and Habitat Concept Plan shall implement, at a minimum, the following measures in open space areas outside the CPSRA, and if allowed, within the CPSRA area:

- ***Restoration and Management of Grasslands:*** *To maintain grassland-associated wildlife species on the site, grasslands extensive enough to support such species shall be maintained and enhanced through the restoration of native grasses. Such grassland habitat shall not be well manicured or regularly mown. No trees shall be planted within such areas, and shrub cover would be limited to a few small, scattered patches of low-statured coastal scrub plants. At a minimum, replacement of non-native grassland impacted at HPS Phase II with native-dominated grassland shall occur at a ratio of 1:1 (1 acre of native-dominated grassland restored: 1 acre of non-native grassland impacted).*
- ***Increase in Tree/Shrub Cover:*** *Trees and shrubs (particularly natives) shall be planted and maintained outside the designated grassland restoration area to provide foraging habitat for raptors and other migratory birds, and cover for mammals, reptiles, and smaller birds that may serve as raptor prey. While native vegetation shall be favored, site-appropriate non-native trees and shrubs that provide food or structural resources that are particularly valuable to native wildlife shall also be considered. Approximately 10,000 net new trees shall be planted at the Project site and in the community, in addition to trees that will be replaced as required by the Urban Forestry Ordinance or MM BI-14a.*

The elements identified above shall be reviewed and approved by a qualified biologist (one familiar with the ecology of the Project site), and the Draft Parks, Open Space, and Habitat Concept Plan shall be implemented during construction of the Project. This plan shall be approved by the Agency prior to construction, and its preparation and implementation shall be the financial responsibility of the Project Applicant.

The Project's ecological enhancements (as detailed in the Draft Parks, Open Space, and Habitat Concept Plan), the requirements specified in mitigation measure MM BI-7b, and new and improved parkland, would provide both raptor foraging opportunities and enhanced raptor and raptor prey habitat. Consequently, adverse effects to raptor foraging habitat would be less than significant. Further, these Project improvements would result in a net increase in the quality of suitable raptor foraging habitat, as well as providing ancillary habitat improvement benefits to their prey species (small mammals, birds, and insects) that could result in a higher prey base for raptors within HPS Phase II. Overall, with mitigation, the effect of the Project on raptors is expected to be beneficial.

⁸⁰²Bloom, P. H. and M. D. McCrary. 1996. The urban Buteo: red-shouldered hawks in southern California. Pages 31-39 in D. Bird, D. Varland, and J. Negro (eds.), *Raptors in Human Landscapes*. Academic Press.

Impact BI-8: Terrestrial Mammals: Western Red Bat

Impact of Candlestick Point

Impact BI-8a **Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on the western red bat, a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant) [Criterion N.a]**

The only special-status bat species with the potential to occur within the Study Area is the western red bat. Potential roosting habitat for this species is present within the Project site in the mature trees where bats would roost in the foliage during migration and during the winter months (August–April). Construction activities that would remove these potential roosting sites could result in a small number of individuals being displaced, injured, or killed. However, several factors need to be taken into account when assessing the potential significance of the displacement or potential loss of a limited number of these individuals:⁸⁰³

1. This species is not a communal rooster, and any one tree would not be expected to contain large numbers of this species. Thus, any impacts to individuals would be very limited on a per-tree basis.
2. This species is highly affiliated with riparian communities that are dominated by mature trees with stands that are greater than 50 meters wide (i.e., red bat populations require fairly extensive stands of riparian forest). Consequently, the habitat on site is not of high quality for roosting or foraging and not essential to the species' survival or reproduction. As a result, few individuals are likely to be present on the site at any one time, and the number of individuals that could be directly impacted by the Project would be very low.
3. This species is not known to breed along the coast and is thought to migrate out of coastal regions to breed. Thus, the habitat on site would not be used for breeding and young would not be impacted.
4. Individuals roost in the canopy, generally well above any work areas and are averse to human disturbances and noise. Thus, if individuals were present they would not be directly impacted by tree removal machinery as they are highly sensitive to noise and disturbance and would likely disperse to other areas while the trees are being removed.
5. The Central Valley of California, particularly the Sacramento and San Joaquin drainages and the lower reaches of the large rivers that drain the Sierra Nevada (i.e., Tuolumne, Merced, and likely the American and Cosumnes), take on disproportional importance for the future viability of this species. Thus, from an ecological sense, the Project would not impact critical range of this species or individuals occupying those areas.

Consequently, while removal of large trees could lead to disturbance and mortality of a very limited number of this species, the loss or disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. Impacts would be less than significant, and no mitigation is required.

⁸⁰³ Pierson, E.D., W.E. Rainey and C. Corben. 2006. Distribution and status of western red bats (*Lasiurus blossevillei*) in California. Calif. Dept. Fish and Game, Habitat Conservation Planning Branch, Species Conservation and Recovery Program Report 2006-04, Sacramento, CA 45 pp.

In addition, the Project's Draft Parks, Open Space, and Habitat Concept Plan identifies ecological enhancement measures, including the planting of approximately 10,000 net new trees at the Project site and in the community, many of which would be suitable roosting habitat for this species, and result in an increase in potential roosting sites. These measures would be required by MM BI-7b. In addition, mitigation measure MM BI-14a requires the replacement of removed trees at a 1:1 ratio. With implementation of MM BI-7b and MM BI-14a, the effect of construction activities at Candlestick Point on the western red bat would be expected to be beneficial.

Impact of Hunters Point Shipyard Phase II

Impact BI-8b Construction at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on the western red bat, a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant) [*Criterion N.a*]

Similar to development at Candlestick Point, potential roosting habitat for this species is present within the Project site in the mature trees where bats would roost in the foliage during migration and the winter months (August—April). Construction activities that would remove these potential roosting sites could result in a small number of individual being displaced, injured, or killed. However, as detailed in Impact BI-8a, while removal of large trees could lead to disturbance and mortality of a very limited number of this species, the loss or disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. Impacts would be less than significant, and no mitigation is required. Further, as discussed in Impact BI-8a, with implementation of MM BI-7b and MM BI-14a, the effect of construction activities on the western red bat would be expected to be beneficial.

Impact BI-9: Marine Mammals and Fish

Impact of Candlestick Point

Impact BI-9a Pile driving associated with construction at Candlestick Point would not have a substantial adverse effect either directly or through habitat modifications, on marine mammals or fish identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact) [*Criterion N.a*]

Development in Candlestick Point has no in-water components that require pile driving and, therefore, would have no substantial adverse effects to sensitive fish or marine mammals as a result of pile driving. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-9b **Pile driving associated with construction of the marina and the Yosemite Slough bridge would not have a substantial adverse effect at HPS Phase II, either directly or through habitat modifications, on marine mammals or fish identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation) [*Criterion N.a*]**

It is possible that any of the sensitive fish species listed in the Setting section could be found within aquatic habitats of HPS Phase II during certain times of year. Those include green sturgeon, Chinook salmon, steelhead, and longfin smelt. Marine mammals such as the harbor seal and California sea lion could also be present. Pacific herring and a number of other non-special-status fish could also occur in these waters. The high noise levels generated by pile driving have the potential to disturb, injure, or kill these species.

Construction of the marina would require the use of a pile driver to install the new pilings required to anchor the floats. New piles may also need to be driven to support and stabilize existing wharves if future investigations identify weaknesses in existing support structures. When piles are struck by a hammer, they generate ground vibrations and sound. When this occurs in the air, we hear the result. When this occurs in water, the effect is transmitted as a pressure wave. The magnitude of this wave is dependent on the type of pile being installed (solid, hollow, concrete, wood, steel) and the hammer being used (impact or vibratory). The combination that generates the strongest wave is a hollow steel pile struck with an impact hammer.

The in-water pressure wave, if of sufficient magnitude, can injure or kill fish. Pressure waves have an actual force associated with them and the stronger the force, the more likely they are to damage sensitive tissues in fish. Pressure waves interact with fish in the water column generating effects from behavioral such as avoidance, to physiological such as stress, temporary loss of hearing, rupture of swim bladders (air pockets that are used for buoyancy), formation of bubbles in the circulatory system and corresponding rupturing of blood vessels, traumatic brain injuries, to death.⁸⁰⁴ Species with swim bladders are the most susceptible although ear structures of any species can be damaged. Current NMFS guidelines indicate that 180 decibels generating 1 micropascal can injure or kill fish.^{805,806} Marine mammals, which have sensitive hearing, can easily be disturbed by sound-generated pressure waves although it would be unlikely to cause injury or mortality.

Construction of the marina could require the installation of about 675 new pilings.⁸⁰⁷ The conceptual design of the marina does not specify pile installation methods, type of pile, or the season during which installation could occur. Based on experience with other marina improvements in San Francisco Bay, steel piles are likely required for at least some structural elements of the marina. As was discussed above,

⁸⁰⁴ Hasting, M.C. and A.N. Popper. Effects of sound on fish. Prepared for California Department of Transportation, January 28, 2005.

⁸⁰⁵ A micropascal is a measure of pressure per unit area where 1 micropascal equals 0.0000145 pounds per square inch.

⁸⁰⁶ NMFS. San Francisco Bay Project Impact Evaluation System. Website: <http://mapping2.orr.noaa.gov/website/portal/pies/piledriving.html>. Accessed February 16, 2009.

⁸⁰⁷ Devick, C. Moffat & Nichol. E-mail to C. Mason and D. Ebert, January 15, 2009 with fill volumes for the Marina.

installation of these piles with an impact hammer has the potential to generate substantial sound pressure waves. Installation of pilings that resulted in generation of sound pressure waves above the threshold indicated could result in the mortality of any of the sensitive species of fish listed above. Additionally, the noise would disrupt normal behavior patterns of marine mammals, which would be a violation of the *Marine Mammal Protection Act*. Either of these effects would be considered a potentially significant impact.

The current design for the Yosemite Slough bridge would have 20 columns supported by steel piles. However, current Yosemite Slough bridge designs would require installation of coffer dams (temporary structures typically constructed with sheet-pilings⁸⁰⁸ that separate a worksite from the water and allow it to be dewatered). The bridge piles would be driven behind dewatered coffer dams. Because piles would be driven behind the coffer dam and, therefore, out of the water, pile installation would not result in generation of in-water sound pressure waves that could injure fish species, and ground pressure waves produced by pile driving within a dewatered coffer dam are not expected to injure fish.

To reduce these impacts the following mitigation measures would be implemented:

MM BI-9b *Pile Driving Design and Minimization Measures. To minimize impacts on fish and marine mammals, the Project Applicant shall implement the following measure to reduce the amount of pressure waves generated by pile driving. The first set of measures shall be implemented during Project design. The second set of measures shall be implemented during construction.*

Design Measures:

- 1. Engineer structures to use fewer or smaller piles, where feasible, and preferably, solid piles.*
- 2. Design structures that can be installed in a short period of time (i.e., during periods of slack tide when fish movements are lower).*

The City/Agency, with consultation from a qualified biologist who is familiar with marine biology, as approved by the City/Agency, shall review the final Project design to ensure that these design requirements have been incorporated into the Project.

Construction Measures:

- 1. Drive piles with a vibratory device instead of an impact hammer if feasible.*
- 2. Restrict driving of steel piles to the June 1 to November 30 work window, or as otherwise recommended by NMFS (driving of concrete piles would not be subject to this condition).*
- 3. If steel piles must be driven with an impact hammer, an air curtain shall be installed to disrupt sound wave propagation, or the area around the piles being driven shall be dewatered using a cofferdam. The goal of either measure is to disrupt the sound wave as it moves from water into air.*
- 4. If an air curtain is used, a qualified biologist shall monitor pile driving to ensure that the air curtain is functioning properly and Project-generated sound waves do not exceed the threshold of 180-decibels generating 1 micropascal (as established by NMFS guidelines). This shall require monitoring of in-water sound waves during pile driving.*
- 5. Unless the area around the piles is dewatered during pile driving, a qualified biologist shall be present during driving of steel piles to monitor the work area for marine mammals. Driving of steel piles shall cease if a marine mammal approaches within 250 feet of the work area or until the animal leaves the work area of its own accord.*

⁸⁰⁸ Sheet piles are flat metal “boards” that are driven into the substrate with a pile driver. They interlock with each other to form a vertical water tight wall.

Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities by recommending the type of piles to use to minimize sound impacts, provide for an alternative method of installation to minimize sound impacts, requiring installation during an agency-approved construction window when fish are least likely to be present and thus avoid the bulk of potential impacts, and require a construction monitor to ensure all measures, including sound monitoring are complied with. This measure would not be required for the Yosemite Slough bridge if piles were driven in dry conditions behind coffer dams, as is proposed, no aquatic pressure waves would be generated. Implementation of this mitigation measure would reduce potential adverse effects to less-than-significant levels.

Impact BI-10: Mollusks

Impact of Candlestick Point

Impact BI-10a **Construction at Candlestick Point would require the removal of hard substrates (riprap) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant) [Criterion N.a]**

Development at Candlestick Point would require limited in-water work. This work would be associated with the shoreline treatments; specifically, the placement of additional (rock) rip-rap, ACB mats, and/or marsh soils to improve the existing riprap shoreline edge for the purpose of reducing shoreline erosion and flooding and improving shoreline habitat. Shoreline treatments would require the removal of some substrate in areas where the Bay is eroding the existing shoreline. In these areas, hard substrates suitable for oyster settlement (rock, riprap, sheet pile, etc) would be removed, potentially directly impacting native oysters. However, in many areas, the same shoreline treatments would entail replacement of this substrate with a similar material that would also be suitable for oyster settlement. These shoreline improvements would temporarily affect substrate used by native oysters; however, habitat for substrate would be replaced with equal amounts of equivalent habitat after the treatments are complete. This would not substantially reduce populations or available habitat. Consequently, Candlestick Point would not have a substantial adverse effect on native oysters. Impacts would be less than significant, and no mitigation is required.

In other areas, particularly along the northern edge of the Candlestick Point shoreline, the placement of ACB mats and/or marsh soils to enhance marsh development could result in the replacement of hardened substrate that may currently provide settlement habitat for oysters with softer marsh substrate that would not support oysters. No large concentrations of oysters are known to occur along the Candlestick Point shoreline, and thus marsh restoration is not expected to result in substantial declines in oyster abundance. Restoration of salt marsh along the Candlestick Point shoreline would increase the input of organic material in the area to some extent, and improvement of the shoreline would reduce erosion, which currently produces turbidity that is likely detrimental to native oysters. Thus, these shoreline improvements would confer some benefits to oysters.

Impact of Hunters Point Shipyard Phase II

Impact BI-10b **Construction at HPS Phase II would require removal of hard substrates (docks, riprap, seawalls, pilings, etc) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant) [Criterion N.a]**

Native oysters are typically found on hard substrates (rock, pilings, breakwaters, etc.) in shallow intertidal and subtidal habitats along the shoreline of the Bay. Any actions that would require the modification of existing hard substrates would have the potential to impact native oysters. Implementation of the Project would also remove small sections of Piers 1, 2, and 3 to separate them from the shore and prevent public access (refer to Figure II-4 [Proposed Land Use Plan]). Those piers provide pilings that are considered a suitable substrate for oyster settlement and thus could be supporting native oysters⁸⁰⁹. The removal of this small section of the piers would, therefore, result in the loss of a very small amount of oyster habitat and potentially of individual oysters. In addition, the Project also includes plans to repair portions of existing seawall structures, place buttress fill (below the water surface) for structural stability of seawall structures, and modify several piers and drydocks along the shoreline of HPS Phase II. These shoreline improvements could affect native oysters and their habitat. As discussed for Candlestick Point above, the end result of shoreline improvements in some areas would be hard substrate similar to what is currently present, and thus equally suitable for oyster colonization. In other areas, the placement of ACB mats and/or marsh soils to enhance marsh development could result in the replacement of hardened substrate that may currently provide settlement habitat for oysters with softer marsh substrate that would not support oysters. These shoreline improvements would temporarily affect substrate used by native oysters, but would not substantially reduce populations or available habitat. Consequently, construction activities at HPS Phase II would not have a substantial adverse effect on native oysters.

In addition, the Project proposes to create a new marina, which would require installation of two breakwater sections (ranging between 300 and 650 feet in length)⁸¹⁰ that would provide suitable settlement habitat for native oysters. Consequently, HPS Phase II construction would result in a series of offsetting impacts; temporary impacts associated with the removal of suitable oyster habitat, followed by the replacement of these areas with new suitable habitat. The new breakwaters would be considered suitable habitat for oyster settlement equating to about 0.10 acre of new habitat. In addition, the construction of approximately 5,700 feet of a floating dock system and 80 feet of gangways that would also provide new suitable habitat for oyster settlement. Therefore, although temporary impacts to oyster habitat would occur during construction, HPS Phase II effects on native oysters would be less than significant and no mitigation is required.

⁸⁰⁹ Couch, D., and T.J. Hassler. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest)—Olympia oyster. US Fish and Wildlife Service Biol. Rep. 82(11.124). US Army Corps of Engineers, TR EL-82-4. 8 pp.

⁸¹⁰ Devick, Christopher, Moffat-Nichol email to Therese Brekke of Lennar Urban and Terri Vitar of PBS&J regarding length of marina breakwater, dated July 23, 2009.

Impact of Yosemite Slough Bridge

Impact BI-10c Construction of the Yosemite Slough bridge may require removal of hard substrates (docks, riprap, seawalls, pilings, etc) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant) *[Criterion N.a]*

Construction of the Yosemite Slough bridge may result in the removal of or modifications to a small amount of riprap where the bridge abutments would be located. Riprap below the MHW elevation may be used by native oysters. However, riprap would also be placed near the abutments once they are constructed, thus replacing any oyster substrate that is temporarily impacted or removed. Furthermore, the bridge piers would provide a hard substrate that could potentially serve as substrate for oyster colonization. Thus, the construction of the Yosemite Slough bridge would not result in the permanent loss of oyster habitat, and could instead result in a net gain in potential substrate for oysters at that location. Therefore, although temporary impacts to oyster habitat would occur during construction, the Yosemite Slough bridge would not have a substantial adverse effect on native oysters. Impacts would be less than significant, and no mitigation is required.

Impact BI-11: Special-status Fish

Impact of Candlestick Point

Impact BI-11a Construction at Candlestick Point would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead, and would not result in impacts to individuals of these species as well as Chinook salmon and longfin smelt through disturbance and loss of aquatic and mudflat habitat as a result of construction of shoreline revetments. (Less than Significant with Mitigation) *[Criteria N.a and N.d]*

Development at Candlestick Point would require minor in-water work associated with the shoreline treatments. Work in these areas would require the repair of existing shoreline protection measures. All work would occur in relatively shallow water areas that are unlikely to support foraging special-status fish.⁸¹¹ Still, the NMFS has considered the entire Bay in the site vicinity to be designated critical habitat for the green sturgeon and Central California Coast steelhead, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by shoreline construction activities.

Construction of shoreline protection measures would primarily entail the reconstruction of the existing shoreline. The new shoreline treatments would be designed to reduce erosion of the shoreline, and thus existing turbidity impacts from coastal erosion would be reduced by the Project. Some additional fill would be placed below the MHW elevation to reduce the slope of the shoreline, thus providing more beach and marsh habitat, following construction of the revetments. As a result, there would be a net

⁸¹¹ Proposed Designation of Critical Habitat for the Southern Distinct Population Segment of North American Green Sturgeon, Draft Biological Report, National Marine Fisheries Service, September 2008.

decrease of approximately 0.42 acre of open waters along the shoreline of Candlestick Point. In addition, temporary impacts to aquatic habitat of these species, including designated critical habitat for the green sturgeon and Central California Coast steelhead, would occur as a result of increased turbidity and movement of materials within aquatic habitat along the shoreline during construction. Because of the regional rarity of these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

Implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2 (described above) would reduce the effects of construction-related activities to aquatic habitat by mitigating for the temporary and permanent loss of jurisdictional waters from the Project as a whole by requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including aquatic habitats. Implementation of these mitigation measures would minimize any adverse effects on aquatic habitat of special-status fish, including designated critical habitat for the green sturgeon and Central California Coast steelhead, during construction and compensate for any residual impacts to these species' habitats resulting from the Project as a whole, thus reducing impacts to special-status fish to less-than-significant levels.

Impact of Hunters Point Shipyard Phase II

Impact BI-11b **Construction at HPS Phase II would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead, and would not result in impacts to individuals of these species as well as Chinook salmon and longfin smelt through temporary and permanent disturbance of aquatic and mudflat habitat during construction of shoreline revetments. (Less than Significant with Mitigation) [Criteria N.a and N.d]**

Construction activities at HPS Phase II include elements that would impact designated critical habitat for green sturgeon and Central California Coast steelhead within the Bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by these activities as well. Construction of the proposed marina (including breakwaters) in what is now open water would result in the loss of habitat for these special-status fish species. Construction of shoreline treatments and placement of fill in other locations around the perimeter of HPS would also affect a small amount of shallow, relatively low-quality foraging habitat for green sturgeon and steelhead, as discussed for Candlestick Point in Impact BI-11a above. Consequently, these elements of the Project would impact existing critical habitat for green sturgeon and Central California Coast steelhead. Because of the regional rarity of all these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

Some Project features would reduce the Project's impacts to these special-status fish species and designated critical habitat. Some areas of shoreline that are currently sheet-pile walls would be modified, and portions of several piers would be removed to provide new aquatic habitat that could be used by these fish. A net increase of approximately 8 acres of new aquatic habitat would result. Furthermore, the

new shoreline treatments would be designed to reduce erosion of the shoreline, and, thus, existing turbidity impacts from coastal erosion would be reduced by the Project.

Compensatory mitigation for impacts to aquatic habitat, which include habitat used by green sturgeon, Central California Coast steelhead, Chinook salmon, and longfin smelt, would be provided as described by mitigation measure MM BI-4a.1, and mitigation measure MM BI-4a.2 shall be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels.

Impact of Yosemite Slough Bridge

Impact BI-11c Construction of the Yosemite Slough bridge would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead through permanent and temporary impacts to aquatic and mudflat foraging habitat. (Less than Significant with Mitigation) [*Criteria N.a and N.d*]

Construction of the Yosemite Slough bridge would impact designated critical habitat for green sturgeon and Central California Coast steelhead through the construction of pilings required to support the bridge. Bridge impact areas are relatively shallow intertidal mud flats that are likely not suitable foraging habitat for either species. Those areas are likely too shallow to meet the depth or food PCEs for sturgeon and should not be considered critical habitat. Specifically, NMFS's own studies show that for juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 1 to 3 meters (approximately 3.3 to 10 feet deep), indicating juveniles likely prefer depths deeper than those within the majority of the proposed bridge construction footprint for rearing and foraging.⁸¹² Nevertheless, it is possible that green sturgeon and Central California Coast steelhead, and possibly other special-status fish such as Chinook salmon and longfin smelt, could forage in the vicinity of the proposed bridge during high tides. Therefore, construction of the bridge could impact these species due to temporarily increased turbidity and modification of mudflat habitat during construction and permanent loss of 0.11 acre of mudflat and aquatic habitat in the footprints of the bridge piers. Because of the regional rarity of all these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

As described under Impact BI-11b above, some Project components would benefit these fish by increasing the extent of open water in the Project area through removal of existing structures and by reducing coastal erosion. In addition, compensatory mitigation for impacts of the bridge to aquatic habitat would be provided as described by mitigation measure MM BI-4a.1, and mitigation measure MM BI-4a.2 shall be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels.

⁸¹² Proposed Designation of Critical Habitat for the Southern Distinct Population Segment of North American Green Sturgeon, Draft Biological Report, National Marine Fisheries Service, September 2008.

Impact BI-12: Essential Fish Habitat

Impact of Candlestick Point

Impact BI-12a Construction at Candlestick Point would not have a substantial adverse effect on designated essential fish habitat through (EFH) or result in a substantial change in total available essential fish habitat through placement of riprap and other fill or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation) [*Criterion N.b*]

The Bay adjacent to the Project site has been designated EFH in the Pacific Coast Salmon Plan,⁸¹³ Coast Pelagics Fishery Management Plan,⁸¹⁴ and Pacific Groundfish Fishery Management Plan.⁸¹⁵ These management plans include species such as northern anchovy (*Engraulis mordax*), Pacific herring, Pacific sardine, Chinook salmon, and a dozen species of groundfish [i.e., starry flounder (*Platichthys stellatus*), English and sand sole (*Parophrys vetulus* and *Psettichthys melanostictus* respectively), leopard shark (*Triakis semifasciata*), lingcod (*Ophiodon elongates*), cabezone (*Scorpaenichthys marmoratus*), and various rockfish]. The only in-water portions of Candlestick Point are associated with shoreline treatments. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered to result in changes to designated EFH. Installation of shoreline treatments would modify EFH due to modification of mudflat habitat and increased turbidity during construction. As shown in Table III.N-4, approximately 4.98 acres of aquatic habitat that would be considered EFH will be impacted by the project. The majority of these impacts would be temporary, as they would occur during replacement of the existing revetment with similar structures. However, as described in Impact BI-11a above, these activities would result in a net decrease of approximately 0.42 acre of open waters along the shoreline of Candlestick Point. Although the EFH that would be temporarily impacted by construction at Candlestick Point represents a minute fraction of available EFH in the Bay, this impact would be substantial, in the absence of mitigation, due to the importance of EFH to the ecology of the Bay.

Impact BI-2 above described the less-than-significant impact of the Project to common fish, shellfish, and mollusks. Although impacts to the populations of common aquatic species would be less than significant, as described in Impact BI-2, construction at Candlestick Point would be considered to have a substantial adverse effect on EFH overall because the function of that habitat would be altered by the Project, potentially having longer-term consequences on aquatic habitat for both common and special-status aquatic species. Any loss of EFH that would result from construction activities at Candlestick Point would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1), and measures to avoid and minimize adverse effects to aquatic habitats, described in mitigation measure MM BI-4a.2, would further reduce potential adverse effects to EFH. To reduce

⁸¹³ PFMC (Pacific Fisheries Management Council) 2003. Pacific Coast Salmon plan: Fishery management plan for commercial and recreational fisheries off the coasts of Washington, Oregon, and California as revised through amendment 14.

⁸¹⁴ PFMC (Pacific Fisheries Management Council) 1998. The coastal pelagic species fishery management plan. As amended through 2006.

⁸¹⁵ PFMC (Pacific Fisheries Management Council) 2008. Pacific coast groundfish fishery management plan for the California, Oregon, and Washington groundfish fishery as amended through amendment 19.

this potential impact to less-than-significant levels, the following mitigation measures would also be implemented.

- MM BI-12a.1 *Seasonal Restrictions on In-Water Work. In-water work when juvenile salmonids are moving through the estuary on the way to the ocean or when groundfish and prey species could be directly impacted shall be avoided. Because steelhead are potentially present, the allowed dredge window for this area of the San Francisco Bay is June 1 through November 30.⁸¹⁶ All in-water construction shall occur during this window. If completion of in-water work within this period is not feasible due to scheduling issues, new timing guidelines that shall be established and submitted to NMFS and CDFG for review and approval.*
- MM BI-12a.2 *Worker Training. Personnel involved in in-water construction and deconstruction activities shall be trained by a qualified biologist (experienced in construction monitoring, as approved by the City/Agency) in the importance of the marine environment to special-status fish, birds, and marine mammals and the environmental protection measures put in place to prevent impacts to these species, their habitats, and Essential Fish Habitat. The training shall include, at a minimum, the following:*
- *A review of the special-status fish, birds, and marine mammals and sensitive habitats that could be found in work areas*
 - *Measures to avoid and minimize adverse effects to special-status fish, birds, marine mammals, their habitats, and Essential Fish Habitat*
 - *A review of all conditions and requirements of environmental permits, reports, and plans (i.e., USACE permits)*

Mitigation measure MM BI-12a.1 would reduce the effects of construction-related activities to EFH by establishing a construction window that would minimize impacts to fish by avoiding migration and breeding periods, and mitigation measure MM BI-12a.2 would ensure that personnel involved in construction and deconstruction activities are trained on measures to avoid and minimize adverse effects to special-status aquatic species and their habitats. Implementation of these mitigation measures, along with mitigation measures MM BI-4a.1 and MM BI-4a.2, would reduce potential adverse effects on EFH at Candlestick Point to less-than-significant levels.

Impact of Hunters Point Shipyard Phase II

Impact BI-12b **Construction at HPS Phase II would not have a substantial adverse effect on designated essential fish habitat through (EFH) through placement of riprap and other fill, or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation) [Criterion N.b]**

The same three fishery management plans and the species covered in those plans discussed in the previous impact statement apply to HPS Phase II. The modifications to EFH that could arise from HPS Phase II are associated with the proposed marina, placement of rock fill to buttress existing bulkheads, and the shoreline treatments. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would

⁸¹⁶ LTMS Environmental Work Windows Work Group. LTMS Informal work windows, Informal consultation preparation packet. Draft version 1.4. February 2004. Website: <http://www.spn.usace.army.mil/conops/informal.pdf>.

remain above the buttresses, this rock would occupy existing fish habitat, and the Project would thus substantially modify EFH within the waters adjacent to the HPS Phase II site.

Overall, activities at HPS Phase II will affect 21.11 acres of aquatic habitat that would be considered EFH. However, in addition to activities resulting in fill of EFH, the Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization and restoration purposes, removal of structures and fill would restore approximately 8 acres of new aquatic habitat, more than offsetting the loss of EFH resulting from placement of fill for buttresses.

Other elements of HPS Phase II construction that could affect EFH are the shoreline treatments. Repairs to the seawall and other shoreline treatments proposed for HPS Phase II would result in modifications to EFH, both due to modification of substrate and mobilization of sediments during construction, but because these impacts are primarily temporary, are localized and often replace an existing failing structure with a similar structure, these repairs would not result in a substantial modification of the function of existing EFH. Also, shoreline improvements along the southern edges of HPS would reduce coastal erosion and associated turbidity, resulting in a long-term benefit to water quality and EFH. Collectively, these repairs and improvements of the Project are not considered to result in a substantial reduction in designated EFH.

Impact BI-2 above described the less-than-significant impact of the Project to common fish, shellfish, and mollusks. Although impacts to the populations of common aquatic species would be less than significant, as described in Impact BI-2, the HPS Phase II development would be considered to have a substantial adverse effect on EFH overall because the function of that habitat would be altered by the Project, potentially having longer-term consequences on aquatic habitat for both common and special-status aquatic species. Any loss of EFH that would result from construction activities at HPS Phase II would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1) and, if necessary, mitigation for impacts to eelgrass (mitigation measure MM BI-5b.3). Measures to avoid and minimize adverse effects to aquatic habitats and eelgrass beds, described in mitigation measures MM BI-4a.2 and MM BI-5b.1 through MM BI-5b.4, would further reduce potential adverse effects to EFH. The measures described above to mitigate impacts to EFH at Candlestick Point (MM BI-12a.1 and MM BI-12a.2) will be implemented at HPS Phase II as well. Because activities at HPS Phase II involve more in-water work than at Candlestick Point, and involve the demolition of existing structures in and immediately adjacent to EFH, the following additional mitigation measures will also be implemented at HPS Phase II to reduce potential impacts to less-than-significant levels.

MM BI-12b.1 Essential Fish Habitat Avoidance and Minimization Measures. The following mitigation measures have been adapted from Amendment 11 of the West Coast Groundfish Plan⁸¹⁷ and Appendix A of

⁸¹⁷ PFMC 1998. Essential Fish Habitat – West Coast Groundfish, Amendment 11.

the Pacific Coast Salmon Plan.⁸¹⁸ Incorporation of the following, or equivalent mitigation as otherwise required by the USACE or NMFS, would reduce the impacts to Essential Fish Habitat (EFH) to a level considered less than significant. Unless modified by the federal permitting agencies (NMFS or USACE), these measures shall be implemented during construction by the Project Applicant. Any reporting required shall be specified in the USACE permits and reports shall be submitted to the USACE and NMFS.

- *If dredging is required, permits will be obtained through the Dredged Material Management Office (DMMO) process, and the following mitigation from the Long-Term Management Strategy (LTMS) shall be implemented:*
 - > *Dredging shall avoid areas with submerged aquatic vegetation (eelgrass beds or other EFH areas of particular concern) especially where the action could affect groundfish, prey of outmigrating juvenile salmon or groundfish, larval marine species, or habitat for native oysters*
 - > *Sediments shall be tested for contaminants as per EPA and USACE requirements. Contaminated sediments shall be disposed of in accordance with EPA and USACE guidelines*
 - > *Slopes of the dredged area shall be gradual enough so that sloughing is unlikely to occur. Verification of these conditions shall be achieved through follow-up bathymetric surveys*
 - > *To minimize turbidity and potential resuspension of contaminated sediments, dredging shall use suction equipment, or similar equipment, when feasible. Where an equipment type may generate significant turbidity (i.e., clamshell), dredging shall be conducted using adequate engineering and best management practices to control turbidity. These include, but are not limited to, sediment curtains and tidal work windows.*
- *All construction equipment used in conjunction with in-water work (pipelines, barges, cranes, etc.) shall avoid wetlands, marshes, and areas of subaquatic vegetation (including eelgrass beds)*
- *Upland disposal options shall be considered for all spoils generated by on-site construction, especially if high levels of contaminants are present*
- *Maximize the use of clean dredged material for beneficial use opportunities, such as salt marsh restoration*
- *Use Best Management Practices (BMPs) for controlling pollution from marina operations, boatyards, and fueling facilities that meet, as applicable, the BMPs listed in the National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating⁸¹⁹*

MM BI-12b.2

Deconstruction/Construction Debris Recovery. A Seafloor Debris Minimization and Removal Plan shall be prepared by the Project Applicant and approved by the City/Agency, prior to initiation of in-water deconstruction (dismantling) or construction activities. The Plan shall be implemented during in-water deconstruction or construction activities, and such activities shall be monitored by a qualified biologist who is experienced in construction monitoring (as approved by the City/Agency). The Seafloor Debris Minimization and Removal Plan shall include, at a minimum:

⁸¹⁸ PFMC 1999. Appendix A: Identification and description of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon. *In* Pacific Coast Salmon Plan (1997) as amended through Amendment 14. Website: <http://www.pcouncil.org/salmon/salfmp/a14.html>.

⁸¹⁹ National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating. EPA 841-B-01-005, November 2001.

- *Debris field boundaries associated with deconstruction activities*
- *Identification of measures taken to minimize the potential for debris to fall into aquatic habitats (i.e., the use of netting below in-water construction or deconstruction areas)*
- *Deconstruction equipment, tools, pipes, pilings, and other materials or debris that are inadvertently dropped into the Bay, along with their descriptions and locations*
- *Circumstances requiring immediate cessation of deconstruction activities and immediate initiation of search and recovery efforts, including procedures for implementing those recovery efforts*
- *How lost debris that is to be removed post-deconstruction is to be identified, who will be conducting search and recovery operations, and the survey methods to be employed to locate lost equipment and materials*
- *Criteria that will be used to:*
 - > *Determine whether recovery efforts are appropriate for the object being recovered and do not result in potential environmental impairment greater than if the debris was allowed to remain in place*
 - > *When sufficient effort has been expended to recover a lost object(s) with no success and continued efforts to recover the seafloor debris have diminishing potential for success and/or result in environmental impairment greater than leaving the debris in place*
- *Person(s) responsible for implementing the Plan and making the determination on the type of recovery required*
- *How debris is to be disposed of or recycled*
- *Metrics for determining when recovery efforts will be considered complete*

Following completion of all post deconstruction recovery efforts for seafloor debris, a report shall be prepared by the Project Applicant and submitted to the City/Agency detailing, at a minimum, (1) recovery activities during deconstruction and post-deconstruction, (2) listings of all lost and recovered debris, (3) final disposition of recovered debris, and (4) discussion of what debris could not be recovered and why.

Mitigation measure MM BI-12b.1 would reduce the effects of construction-related activities to EFH by avoiding areas with submerged vegetation thereby protecting habitat, and managing construction equipment with Best Management Practices to prevent contamination. Mitigation measure MM BI-12b.2 would mandate the creation and implementation of a Seafloor Debris Removal Plan. This Plan shall include sufficient environmental protection measures to ensure effective recovery of lost Project debris and minimize potential environmental impacts posed by the debris, or debris recovery to designated EFH or other sensitive Bay habitats and biota (i.e., critical habitat and herring spawning habitats). Implementation of these mitigation measures would reduce potential adverse effects on EFH at HPS Phase II to less-than-significant levels.

Impact of Yosemite Slough Bridge

Impact BI-12c Construction of the Yosemite Slough bridge would not have a substantial adverse effect on designated essential fish habitat through (EFH) through placement of riprap and other fill, or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation) [*Criterion N.b*]

Construction of the Yosemite Slough bridge would impact EFH through the construction of pilings required to support the bridge. As detailed in Table III.N-4, the amount of area impacted is approximately 1.28 acres of temporary impacts and 0.40 acre of permanent impacts, which includes both on site and off site areas. These impacts would have a substantial adverse affect on EFH because the function of portions of the impacted habitat would be permanently altered by the Project, a significant impact.

Any loss of EFH that would result from the Yosemite Slough bridge would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1). Measures to avoid and minimize impacts to aquatic habitats, described in mitigation measure MM BI-4a.2, would further reduce impacts to EFH. To reduce these potential impacts to less-than-significant levels, mitigation measures MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would be implemented. Mitigation measure MM BI-12a.1 would reduce the effects of construction-related activities to EFH by establishing a construction window that would minimize impacts to fish by avoiding migration and breeding periods. Mitigation measure MM BI-12a.2 would ensure that personnel involved in deconstruction activities are trained on measures to avoid and minimize adverse effects to special-status aquatic species and their habitats. Mitigation measure MM BI-12b.1 would avoid areas with submerged vegetation thereby protecting habitat and manage construction equipment with Best Management Practices to prevent contamination. Mitigation measure MM BI-12b.2 would mandate the creation and implementation of a Seafloor Debris Removal Plan. This Plan shall include sufficient environmental protection measures to ensure effective recovery of lost Project debris and minimize potential environmental impacts posed by the debris, or debris recovery to designated EFH or other sensitive Bay habitats and biota (i.e., critical habitat and herring spawning habitats). Implementation of these mitigation measures would reduce potential adverse effects on EFH in Yosemite Slough to less-than-significant levels.

Impact BI-13: Wildlife Movement

Impact of Candlestick Point

Impact BI-13a Construction at Candlestick Point would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites. (Less than Significant) [*Criterion N.d*]

As discussed in the Setting section, surveys of Candlestick Point and review of background studies did not identify any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that

provide substantial movement corridors or migratory pathways occur within Candlestick Point. No areas that would be considered nursery sites, which generally include some types of wetlands and avian rookeries, are found within Candlestick Point. The area surrounding Candlestick Point is part of the San Francisco Bay estuary, and the areas of the estuary affected by the Candlestick Point portion of the Project would be the existing shoreline structures. These structures would be replaced with new similar structures that would be designed to provide even higher-quality habitat for wildlife, including estuarine species, than the existing shoreline. In addition, although migratory fish could move through the open water and tidal portion of the site, Candlestick Point does not contain any migratory fish pathways such as anadromous fish streams or rivers (fish that breed in freshwater and spend adult lives in the ocean) and Project construction would not fragment habitat or create substantial barriers to movement through the adjacent waters. Consequently, construction at Candlestick Point would affect primarily terrestrial species well adapted to human disturbance that move locally within the Project site and the adjacent habitat patches. These common ground-dwelling vertebrates forage for food, mate, and move between habitat patches within the site and typically have small ranges that would limit their movement to localized use. Construction at Candlestick Point would not substantially interfere with this local movement as the wildlife would be able to continue their pre-Project activities in the areas not under construction, and construction would not permanently bar their movement through those portions of the site. Consequently, as the Project would not interfere substantially with the movement of native resident or migratory wildlife species, established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites, impacts would be less than significant. No mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-13b Construction at HPS Phase II and construction of the Yosemite Slough bridge would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, but it could impede the use of native wildlife nursery sites. (Less than Significant with Mitigation) [Criterion N.d]

As discussed in the Setting section, surveys of HPS Phase II did not identify any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within HPS Phase II. Consequently, construction at HPS Phase II would affect primarily terrestrial species that are well adapted to human disturbance in the area and move locally within the Project site and between the adjacent habitat patches. These common ground-dwelling vertebrates forage for food, mate, and move between habitat patches within the site and typically have small ranges that would limit their movement to localized use. Construction of HPS Phase II would not substantially interfere with this local movement as the terrestrial wildlife would be able to continue their pre-Project activities in the areas not under construction, and construction would not permanently bar their movement through those portions of the site as the construction activities would be temporary.

The Yosemite Slough bridge would separate the upper part of Yosemite Slough, including the proposed restoration site, from South Basin and San Francisco Bay. This structure would not, however, substantially reduce the ability of fish or wildlife that currently move in and out of Yosemite Slough to

continue doing so. The bridge's low, flat profile would allow birds to easily fly over the bridge between the upper part of the slough and South Basin, but the bottom of the bridge deck is high enough to allow swimming birds such as ducks to swim under the bridge when tidal conditions would currently permit such movements. The bridge's piers would occupy only a very small fraction of the aquatic habitat within the bridge footprint, and thus fish and other aquatic species would be able to easily move in and out of the slough even after the bridge is constructed. Although the bridge and the road crossing it would impede movement of terrestrial species from one side of the bridge to the other, sufficient terrestrial space would be present above the high tide line at the abutments to allow terrestrial wildlife to pass under the bridge. Consequently, Project activities within HPS Phase II and Yosemite Slough would not substantially interfere with the movement of any native resident or migratory terrestrial species.

With respect to aquatic species, although migratory fish could move through the open water and the Yosemite Slough, HPS Phase II does not contain any substantial migratory fish pathways such as anadromous fish (fish that breed in freshwater and spend adult lives in the ocean) streams or rivers and Project construction, including the Yosemite Slough bridge, would not further fragment habitat or create substantial barriers to movement though the adjacent waters such to prevent aquatic species from moving freely along the coastline. However, as discussed in Impact BI-5b, construction of HPS Phase II components such as breakwaters and other shoreline treatments would occur near eelgrass beds, which could remove them or indirectly impact them such that productivity and survival of these habitats would be reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be a significant impact, as it would substantially impede the use of the only two patches of eelgrass habitat (wildlife nursery sites) in the HPS Phase II site. To reduce these impacts, mitigation measures MM BI-5b.1 through MM BI-5b.4 would be implemented.

Implementation of mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects of HPS Phase II construction on eelgrass by avoiding impacts through initial design if feasible; determining the locations of eelgrass beds through surveys; using survey data to refine shoreline treatments to further avoid or minimize impacts to eelgrass; and compensating for unavoidable impacts through the creation or restoration of eelgrass beds at a 3:1 ratio. Consequently, implementation of these measures would reduce impacts to eelgrass beds, and thus to nursery sites, to less-than-significant levels. This would ensure that construction of HPS Phase II would not interfere substantially with the use of native wildlife nursery sites. Implementation of these mitigation measures would reduce this impact to a less-than-significant level.

Impact BI-14: Local Plans and Policies

Impact of Candlestick Point

Impact BI-14a **Construction at Candlestick Point would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation) [*Criterion N.e*]**

The *City of San Francisco General Plan* articulates broad policies to protect natural resources and federally and state listed species, and work with federal and state agencies. The General Plan does not identify any additional, specific resources for protection beyond those identified by federal and state agencies. This

document analyzes the impacts of the project on natural resources identified for protection by such federal and state policies, and identifies mitigation measures to reduce or avoid significant impacts. The Project would not, therefore, conflict with the natural resource protection policies of the General Plan.

In addition, the City has adopted an Urban Forestry Ordinance to protect street trees within the jurisdiction of the DPW, and significant and landmark trees within the jurisdiction of the DPW or on private property. Section 143 of the City's Planning Code requires the planting of street trees when constructing new buildings within specified land use districts. According to the City's registry of "landmark trees", no such trees are present on Candlestick Point or elsewhere in the Project area.⁸²⁰ A tree survey⁸²¹ was conducted within all of the Project site except the portion of CPSRA that is not subject to the land transfer and is thus not subject to direct impacts from this Project. This survey identified approximately 1,976 "tree"⁸²² stems emanating from 1,068 individual plants on Candlestick Point. Of these, approximately 1,079 stems meet the size criteria for "significant trees", as defined by the Urban Forestry Ordinance, and any of these trees that is (1) on property under the jurisdiction of the Department of Public Works or (2) on privately owned-property with any portion of its trunk within 10 feet of the public right-of-way would be considered a significant tree. Likewise, any of the 1,976 trees on Candlestick Point growing within the public right-of-way or on land under the jurisdiction of the Department of Public Works would be considered a "street tree"; some trees meet the criteria of both significant trees and street trees. The vast majority of these trees consisted of multiple-stemmed myoporum; eucalyptus, pines, and olives were also well represented. All four of these species are non-natives.

Construction activities associated with Candlestick Point could result in disturbance or loss of trees within DPW jurisdiction. These trees would be subject to the requirements of the *Public Works Code*, which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The *Planning Code* does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143. Mitigation measure MM BI-14a would ensure that development in Candlestick Point does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size

⁸²⁰ http://www.sfenvironment.org/our_programs/interests.html?ssi=4&ti=8&ii=131.

⁸²¹ H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.

⁸²² For the purpose of this survey, any stem of a woody plant with a tree-like (as opposed to shrubby) growth habit measuring at least 2 inches in diameter at a height of 4.5 feet above the ground was considered a "tree."

specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with Planning Code Section 143.

MM BI-14a

Preservation and Replacement of Significant Trees, and Preservation and Planting of Street Trees. Construction activities outside of the Department of Public Works (DPW) jurisdiction could result in the disturbance or removal of a large number of trees. To minimize this impact, the following measures shall be implemented by the Project Applicant in these areas:

- 1. Avoidance of the removal of trees that meet the size specifications of significant trees in the Public Works Code Article 16 shall occur to the maximum extent feasible, and any such trees that are removed shall be replaced at a minimum of 1:1 (1 impacted:1 replaced). The species used for replacement shall be consistent with DPW recommendations.*
- 2. Street trees shall be planted in all new development areas. The species, size, and locations shall be consistent with the requirements specified in Planning Code Section 143, including, but not limited to, the following:*
 - a) The street trees installed shall be a minimum of one 24-inch box tree for each 20 feet of frontage of the property along each street or alley, with any remaining fraction of 10 feet or more of frontage requiring an additional tree. Such trees shall be located either within a setback area on the lot or within the public right-of-way along such lot.*
 - b) The species of trees selected shall be suitable for the site, and, in the case of trees installed in the public right-of-way, the species and locations shall be subject to the approval by the DPW. Procedures and other requirements for the installation, maintenance, and protection of trees in the public right-of-way shall be as set forth in Public Works Code Article 16.*
- 3. If a significant tree or street tree will not be removed, but construction activities will occur within the dripline of such trees, a Tree Protection Plan shall be prepared by an International Society of Arboriculture (ISA) certified arborist, in accordance with the Urban Forestry Ordinance. This plan shall be submitted to the Planning Department for review and approval prior to issuance of a demolition or building permit. The Tree Protection Plan shall include measures to protect all parts of a tree from disturbance during construction, and may include the following:*
 - a) A site plan with tree species, trunk location, trunk diameter at breast height, and the canopy dripline area within development*
 - b) The use of protective fencing to establish an area to be left undisturbed during construction*
 - c) Protection specifications, including construction specifications such as boring instead of trenching for utility lines, or tree specifications such as drainage, fertilization, or irrigation measures*
 - d) Pruning specifications, if needed, to preserve the health of the tree and allow construction to proceed*

Mitigation measure MM BI-14a would encourage the preservation of street trees and trees that are large enough to meet the size specification of significant trees in the *Public Works Code*, and would require the replacement of large trees that are removed. Further, it would require the planting of street trees consistent with the intent of the *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. With implementation of mitigation measures MM BI-14a

and MM BI-7b, the Project would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees. Impacts would be less than significant.

Further, the Draft Parks, Open Space, and Habitat Concept Plan (as required by mitigation measure MM BI-7b) includes the planting of approximately 10,000 net new trees, avoids removal of native trees where feasible, and establishes new parkland and open space that would include a predominance of native species (see Impact BI-2 and Impact BI-7b). The planting of an estimated 10,000 net new trees at the Project site and in the community would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. Consequently, development of Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, and overall impacts would be beneficial.

Impact of Hunters Point Shipyard Phase II

Impact BI-14b Construction at HPS Phase II and Yosemite Slough bridge would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation) [Criterion N.e]

Similar to development at Candlestick Point, construction activities associated with HPS Phase II would be consistent with the policies of the *City of San Francisco General Plan* relating to biological resources. In addition, the City has adopted an Urban Forestry Ordinance to protect street trees within the jurisdiction of the DPW, and significant and landmark trees within the jurisdiction of the DPW or on private property. Section 143 of the City's Planning Code also regulates the planting of street trees associated with construction of buildings within specified land use districts. According to the City's registry of "landmark trees", no such trees are present on HPS Phase II or elsewhere in the Project area.⁸²³ A tree survey⁸²⁴ conducted for the Project identified approximately 854 "tree" stems emanating from 328 individual plants on HPS Phase II. Of these, approximately 400 stems meet the size criteria for "significant trees", as defined by the Urban Forestry Ordinance. Although most of HPS Phase II is within the jurisdiction of the Navy, if and any of these trees are (1) on property under the jurisdiction of the Department of Public Works or (2) on privately owned-property with any portion of its trunk within 10 feet of the public right-of-way, it would be considered a significant tree under the Urban Forestry Ordinance. Likewise, any of the 854 trees on HPS Phase II growing within the public right-of-way or on land under the jurisdiction of the Department of Public Works would be considered a "street tree"; some trees meet the criteria of both significant trees and street trees. Trees recorded on HPS Phase II during the tree survey were dominated by small, multi-stemmed toyon (*Heteromeles arbutifolia*; a native species, though the trees on HPS appear to be of an ornamental variety) and several non-natives, including London planetree (*Platanus x acerifolia*) and acacia (*Acacia* spp.).

Construction activities associated with HPS Phase II could result in disturbance or loss of trees within DPW jurisdiction, including areas outside of the Navy's property (i.e., City streets adjoining the HPS Phase II areas) or within on-site and off-site areas of Yosemite Slough (i.e., where construction of infrastructure may occur). These trees would be subject to the requirements of the *Public Works Code*,

⁸²³ http://www.sfenvironment.org/our_programs/interests.html?ssi=4&ti=8&ii=131.

⁸²⁴ H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.

which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The *Planning Code* does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143. Mitigation measure MM BI-14a would ensure that development in HPS Phase II does not result in conflicts with these policies by requiring preservation of street trees and trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. Therefore, with implementation of mitigation measure MM BI-14a, impacts would be less than significant.

Further, the Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) includes the planting of approximately 10,000 net new trees at the Project site and in the community, avoids removal of native trees where feasible, and establishes new parkland and open space that would include a predominance of native species (refer to Impact BI-2 and Impact BI-7b). The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area, increase canopy cover, and promote a healthy and sustainable urban forest. Consequently, development of HPS Phase II and construction of the Yosemite Slough bridge would not conflict with any local policies or ordinances protecting biological resources, and overall impacts would be beneficial.

Impact BI-15: Contaminated Soils or Sediments during Construction

Impact of Candlestick Point

Impact BI-15a Construction within the shoreline or Bay at Candlestick Point would not result in the disturbance of contaminated soil or the re-suspension of contaminated sediments. (No Impact) [Criteria N.a and N.b]

There are no sites with known contamination requiring remediation at Candlestick Point. Therefore, fish or wildlife species, and aquatic communities would not be exposed to contaminated fill or Bay/shoreline sediments during construction activities, and there would be no impact. No mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-15b **Construction within the shoreline or Bay at HPS Phase II would not result in the disturbance of contaminated soil or the re-suspension of contaminated sediments. (Less than Significant with Mitigation) [Criteria N.a and N.b]**

As discussed in Section III.K (Hazards and Hazardous Materials) of this EIR, chemicals and radioactive materials are present in soil and groundwater in various locations throughout the HPS Phase II site at levels that require remediation. Disturbance of fill or shoreline sediments, and associated stockpiling and on-site soil movement, during construction could provide potential pathways through which fish and wildlife species could be exposed to contaminants in fill material or Bay/shoreline sediments. Exposure of fish and wildlife to such contaminants could potentially impair the health or productivity of exposed individuals, or could have food-chain effects on species that prey upon exposed individuals through bioconcentration of contaminants. Contaminant exposure that adversely affects the health or productivity of special-status fish or wildlife species, or that adversely affects large numbers of individuals of common fish and wildlife species, would be considered a substantial adverse effect.

As discussed in Section III.K, the Navy is responsible for some remediation activities (i.e., radiological contamination) on HPS Phase II. Because contaminants have been identified in those parcels for which remedial actions have been selected but not yet implemented by the Navy, construction of shoreline improvements has the potential to disturb sediment or soil that may contain chemical contaminants. However, if the Navy does not complete its remediation activities in advance of Project activities, the San Francisco Redevelopment Agency (SFRA) or the Project Applicant would implement the remaining remediation activities in conjunction with shoreline improvement activities, with appropriate regulatory oversight, as required by mitigation measure MM HZ-10b. Impact HZ-10b discusses the process that would be followed by SFRA or the Project Applicant in conjunction with development activities with appropriate regulatory oversight to manage potentially contaminated sediments that could be affected by Project shoreline improvements.

In addition, as discussed in Section III.M (Hydrology and Water Quality) of this EIR, implementation of measures to control stormwater runoff during construction would control discharge of potential chemicals adhered to soil in the runoff. Mitigation measures MM HY-1a.1 and MM HY-1a.2 would require preparation of a SWPPP to identify the specific measures and BMPs that are applicable to HPS Phase II construction activities in the event of a spill of construction materials or exposure of hazardous materials. This would reduce the likelihood of contaminants being conveyed to near-shore and offshore environments, which would reduce the risk to the aquatic environment and species that rely on that habitat (e.g., birds and mammals).

Implementation of mitigation measures MM HZ-10b, MM HY-1a.1, and MM HY-1a.2 would reduce the exposure of fish or wildlife to contaminated fill or Bay/shoreline sediments during construction activities, and adverse effects would be less than significant.

■ Operational Impacts

Impact BI-16: Sensitive Birds and Marine Mammals

Impact of Candlestick Point

Impact BI-16a Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS or interfere substantially with the movement of any native resident or migratory fish, or impede the use of native wildlife nursery sites. (Less than Significant) [*Criteria N.a and N.d.*]

Operation of the development at Candlestick Point does not contain an in-water operational component and would not impact birds or marine mammals within the waters of the Bay. There are no known marine mammal pupping sites or major haulout locations within Candlestick Point where animals would be subject to increased disturbance during operation. Consequently, operation of Project components at Candlestick Point would not have a substantial adverse effect on these sensitive aquatic resources.

Human activity at Candlestick Point following completion of construction would affect wildlife, including invertebrates, reptiles, amphibians, birds, and mammals. Potential adverse effects include disturbance of individuals (including nesting birds) in terrestrial, shoreline, and aquatic habitats due to movement by humans, domestic animals, and vehicles; depredation of native species by domestic animals; injury or mortality of individuals due to vehicular traffic; and other impacts. However, as discussed in Impact BI-2, adverse effects of human disturbance and other operational factors would occur primarily to small numbers of regionally abundant species, and operational impacts would not substantially affect populations of these species. Impacts would be less than significant, and no mitigation is required.

Furthermore, for many of these common species, adverse effects of human disturbance on local (i.e., Project-wide) numbers would be offset by the benefits of habitat improvements incorporated into the Project's Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b). Thus, operational activities at Candlestick Point would benefit terrestrial biological resources.

Impact of Hunters Point Shipyard Phase II

Impact BI-16b Implementation of the Project at HPS Phase II, including operation of the proposed marina, would not have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS or interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant) [*Criteria N.a and N.d.*]

Operation of the marina and marina-related activities (personal watercraft operations) would have the potential to disturb marine mammals and birds. The marine mammals most likely to be disturbed are locally foraging harbor seals. There are no known pupping sites or major haulout locations where animals would be subject to increased disturbance from vessel traffic from the Project. San Francisco Bay provides resting and foraging habitat for a variety of waterfowl migrating along the Pacific flyway. These birds often congregate into relatively large rafts of birds. Those rafts are subject to the disturbance from noise, size, speed, and wakes generated by vessel traffic. The common response to disturbance is for the birds to fly off the water surface and fly some distance away and land. Both the marina and marina-related (personal watercraft operations) activities would increase the disturbance to birds resting and foraging on Bay waters. However, out of a 300-slip marina, only a small percentage of the boats docked there are expected to be in use at any one time. Considering the size of the Bay, the number of boats currently on the bay at any one time, and the amount of disturbance currently generated by the existing boats on the Bay, the few boats that at any one time are moving from the proposed marina into the Bay are not expected to generate substantial additional disturbance over current conditions. Consequently, they would not have substantial adverse effects on migrating or resting waterfowl.

Piers 1, 2, and 3 at the south side of HPS Phase II would be separated from the shore, but would remain in place. Those piers could provide resting, and potentially nesting, habitat for gulls, terns, and other marine-oriented species. Recreational use of the area would be limited to fishing from boats; however, the water is relatively shallow and not likely to support substantial populations of sportfish such that large amounts of angler (recreational fishermen) disturbance would be generated at any one time. Also, the existing piers are well above the water surface, separating resting birds from direct interaction with anglers. Therefore, recreational boating or fishing in this area would not be expected to substantially affect birds using or traveling to and from those piers. For these reasons, the operation of the marina and marina-related activities the marina would not have a substantial adverse effect on marine mammals and resting waterfowl.

Human activity at HPS Phase II following completion of construction would affect wildlife, including invertebrates, reptiles, amphibians, birds, and mammals, as described above for Candlestick Point. However, adverse effects of human disturbance and other operational factors would not substantially affect populations of these species. Impacts would be less than significant, and no mitigation is required.

Furthermore, for many of these common species, adverse effects of human disturbance on local (i.e., Project-wide) numbers would be offset by the benefits of habitat improvements incorporated into the

Project's Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b). Thus, operational activities on HPS Phase II would benefit terrestrial biological resources.

Impact BI-17: Nesting American Peregrine Falcons

Impact of Candlestick Point

Impact BI-17a Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on nesting American peregrine falcons, identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact) [*Criterion N.a*]

No American peregrine falcons nests are found within Candlestick Point. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-17b Implementation of the Project at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on nesting American peregrine falcons, identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact) [*Criterion N.a*]

As previously discussed under Impact BI-6b, a resident pair of American peregrine falcons has been observed successfully nesting on the Re-gunning crane on Parcel D of HPS Phase II. The Project's operations would not result in substantial adverse effects to the falcons' nesting activities as the nesting pair currently present has persisted, and nested successfully, at this site for several years even while remediation activities have been ongoing in the vicinity of the nest site. Many pairs of this species nest in high disturbance and heavily illuminated locations such as the towers in downtown San Francisco (i.e., the Pacific Gas and Electric Company's Headquarters) and the Bay Bridge (adjacent to construction activities). Operation activities of the Project would not result in substantial adverse effects on nesting American peregrine falcons. No impact would occur, and no mitigation is required.

Impact BI-18: Sensitive Aquatic Species, Mollusks, and Designated EFH

Impact of Candlestick Point

Impact BI-18a Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the NMFS. (No Impact) [*Criteria N.a and N.b*]

Operational activities within Candlestick Point do not contain an in-water operational component and would not generate increases in turbidity or other impacts that could adversely affect species identified as a candidate, sensitive, or special-status, or designated EFH. Rather, the shoreline improvements would

reduce erosion relative to existing conditions, thus reducing the potential for any re-suspension of sediments. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-18b **Implementation of the marina in HPS Phase II would require routine maintenance dredging of the marina, which could remove habitat or generate substantial increases in turbidity within the marina, but would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the NMFS. (Less than Significant with Mitigation) [Criteria N.a and N.b]**

Routine dredging of the marina could be required to maintain operational depth over the life of the Project. Dredging of marinas typically involves a clamshell excavator, which is used to physically remove sediments that are then transported off site for disposal. This method of sediment removal results in massive suspension of Bay mud. Those particles eventually settle out onto the seafloor and surrounding substrates. Up to several inches of new sediment deposition is possible. This would result in Project effects on sensitive species and EFH through two avenues.

The first is alteration of or removal of habitat, which occurs when this sediment settles out onto native oysters or spawning substrate for herring (there is no known eelgrass within the marina location). Oysters require hard substrates to attach to and are unable to move above layers of sediment as they are deposited. Oysters are likely found on most hard substrates within the area and would settle onto the new breakwaters, piers, and floating dock system. Increased rates of sediment accumulation could decrease their survival. Pacific herring attach their eggs to hard substrates and aquatic vegetation (docks, pilings, piers, eelgrass, etc). Sediment accumulation that would affect herring would only occur on relatively flat substrates (i.e., riprap). Because herring can spawn on vertical substrates (i.e., piers or breakwaters) and they can actively choose spawning habitats, the deposition of sediment within the marina would not result in a substantial reduction in available habitat.

The second avenue of potential impact could occur if the sediment plume disrupts behavior of fish managed under EFH regulations. These disturbances are expected to be temporary because fish can swim away from the plume and dredging operations. Because of this, maintenance dredging of the marina would have only a temporary impact on these species, and this is considered a less-than-significant impact. Pacific herring could spawn within the marina, but all dredging windows for the Bay do not allow dredging to occur during the spawning season, and, therefore, dredging would not impact spawning herring resource.

Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina maintenance dredging to less-than-significant levels by requiring compensatory mitigation for impacts to oysters and EFH that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat and EFH. Mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities. Consequently, implementation of both

measures would reduce adverse effects of sedimentation associated with dredging to less-than-significant levels.

MM BI-18b.1 Maintenance Dredging and Turbidity Minimization Measures for the Operation of the Marina. Maintenance dredging for the marina could remove or generate sediment plumes that could impact special-status species, their habitats, and Essential Fish Habitat (EFH). To minimize this effect, the following measures shall be implemented by the Project Applicant:

- 1. Conduct a detailed survey for native oysters in all suitable substrates within the marina, which includes the area between the land and breakwaters, after construction of the new breakwaters. This survey shall be conducted by a qualified oyster biologist at low tides that expose the maximum amount of substrate possible. Surveys can be conducted at any time of year, but late summer and early fall are optimal because newly settled oysters are detectable. This survey shall occur before any construction within the proposed marina location takes place to establish a baseline condition. If few or no oysters are observed on hard substrates that would remain in place after dredging, no further mitigation is required.*
- 2. If oysters are found at densities at or above 90 oysters per square meter⁸²⁵ on suitable oyster-settlement substrates that would be removed or in areas where dredging sediment could settle out onto the oysters, a detailed sediment plume modeling study of the proposed marina operation shall be conducted to determine if the operations and maintenance of the marina would generate a substantial plume of sediment. This model shall include the local bathymetry and sediment information, tidal data, and detailed marina information (number and types of boats, etc). The model shall be prepared by a qualified harbor engineer (as approved by the City/Agency) with direct experience in this type of work within San Francisco Bay, prior to issuance of any permits for the construction of features directly associated with the marina. A report documenting modeling methods, input data, assumptions, results, and implications for increased rates of sedimentation shall be prepared and provided to NMFS during the USACE-directed Section 7 and EFH consultation for the marina. If the model demonstrates minimal sediment resuspension that would settle out before reaching sensitive habitats, no further mitigation is required.*
- 3. If the sediment plume reaches sensitive shoreline habitats (substrates that support native oysters), compensatory mitigation shall be provided by the Project Applicant at a ratio recommended by NMFS for the type of habitat adversely affected. The Project Applicant shall retain a qualified oyster biologist (as approved by the City/Agency) to develop an Oyster Restoration Plan that shall be reviewed and approved by the City/Agency. This Plan shall include site selection, substrate installation, and monitoring procedures, and include the following components (unless otherwise modified by NMFS):*
 - > A suitable site for installation of replacement substrate would be one with adequate daily tidal flow, a location that would not be affected by maintenance dredging or other routine marina maintenance activities, and one that is lacking in appropriate settlement substrate. A location outside of the new breakwaters or in association with any eelgrass mitigation sites would be appropriate.*
 - > Although oysters would settle on a variety of materials, the most appropriate for restoration purposes is oyster shell. This is typically installed by placing the shell into mesh bags that can then be placed in piles on the seafloor of the mitigation site. Enough shell shall be installed*

⁸²⁵ MACTEC Engineering and Consulting, Inc. 2008. Oyster Point Marina Olympia Oyster Surveys Pre- and Post-Dredging February 2008, Oyster Point Marina, South San Francisco, California. Prepared for PBS&J; Obornolte. 2009. Personal communication between MACTEC and PBS&J.

under the guidance of a qualified oyster biologist to make up for the loss attributable to the Project. Mitigation shall occur after construction of all in-water elements of the Project within HPS Phase II.

- > *The restoration site shall be monitored on a regular basis by a qualified oyster biologist for a minimum of two years, or until success criteria are achieved if they are not achieved within two years. Monitoring shall involve routine checks (bi-monthly during the winter and monthly during the spring and summer) to evaluate settlement, growth, and survival on the mitigation site. Success shall be determined to have been achieved when settlement and survival rates for oysters are not statistically significantly different between the mitigation site and either populations being impacted (if data are available) or nearby established populations (i.e., Oyster Point Marina).*

MM BI-18b.2 Implement BMPs to Reduce Impacts of Dredging To Water Quality. BMPs established in Appendix I of the Long-Term Management Strategy (LTMS) for management of disposal of dredge material in San Francisco Bay are designed specifically to minimize spread of contaminants Long-Term Management Strategy (LTMS) outside of dredge areas. All of these elements of the LTMS shall be applied to any proposed dredging or construction activities associated with the Project unless otherwise modified by the USACE, BCDC, or SFRWQCB in permit conditions associated with the proposed dredging activities associated with this Project (same as MM BI-19b.2).

Impact BI-19: Contaminated Sediments during Operation

Impact of Candlestick Point

Impact BI-19a Implementation of the Project at Candlestick Point would not result in impacts to aquatic organisms through the re-suspension of contaminated sediments. (No Impact) [Criteria N.a and N.b]

Operational activities within Candlestick Point do not contain an in-water operational component and would not result in the re-suspension of contaminated sediments that could have health consequences for sensitive fish species and degrade EFH. Rather, the shoreline improvements would reduce erosion relative to existing conditions, thus reducing the potential for any re-suspension of contaminants. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-19b Implementation of the marina in HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on sensitive aquatic species, identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS, or have a substantial effect on predators that prey on contaminated species or feed on contaminated substrates as a result of routine maintenance dredging or could generate routine increases in turbidity within the marina that would result in the re-suspension of contaminated sediments. (Less than Significant with Mitigation) [Criteria N.a and N.b]

Much of the seafloor within the Study Area is contaminated from decades of industrial use.⁸²⁶ The primary contaminants are metals such as copper, lead, mercury, and polychlorinated biphenyl (PCBs), concentrations of which diminish with distance from the shoreline.⁸²⁷ Routine dredging activities required to maintain operational depth of the marina could result in the suspension of contaminated sediments from the seafloor. Contaminants in these sediments may be taken up by aquatic organisms, either within the marina or in other areas to which contaminated sediments are carried by tides or currents. The uptake of contaminated food sources or exposure to elevated levels of toxins can reduce reproductive success, alter blood chemistry, suppress a fish's immune systems, and result in an increased risk of disease and mortality.^{828,829} These effects may occur in aquatic organisms that take up contaminated substances directly, wildlife species (such as shorebirds) that forage in contaminated substrates, or predators that feed on prey that have taken up contaminants. Such impacts are potentially significant.

To reduce these impacts to less-than-significant levels, the following mitigation measures would be implemented.

- MM BI-19b.1 Work Windows to Reduce Maintenance Dredging Impacts to Fish during Operation of the Marina. According to the Long-Term Management Strategy (LTMS), dredging Projects that occur during the designated work windows do not need to consult with NMFS under the federal Endangered Species Act (FESA).⁸³⁰ The window in which dredging is allowed for the protection of steelhead in the central Bay is June 1 to November 30. The spawning season for the Pacific herring is March 1 to November 30.⁸³¹ Therefore, the window that shall be applied to minimize impacts to sensitive fish species is December 1 to February 28, upon consultation with NMFS.
- MM BI-19b.2 Implement BMPs to Reduce Impacts of Dredging To Water Quality. BMPs established in Appendix I of the Long-Term Management Strategy (LTMS) are designed specifically to minimize spread of contaminants outside of dredge areas. All of these elements of the LTMS shall be applied to any proposed dredging or construction activities associated with the Project unless otherwise modified by the USACE, BCDC, or the San Francisco Bay Regional Water Quality Control Board in permit conditions associated with the proposed dredging activities associated with this Project (same as MM BI-18b.2).

Implementation of mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce contamination associated with dredging to less-than-significant levels by (1) reducing the effects of increased

⁸²⁶ Barajas and Associates, Inc. 2008. Final Feasibility Study Report for Parcel F, Hunters Point Shipyard, San Francisco, California. Prepared for Base Realignment and Closure Program Management Office West.

⁸²⁷ Barajas and Associates, Inc. 2008. Final Feasibility Study Report for Parcel F, Hunters Point Shipyard, San Francisco, California. Prepared for Base Realignment and Closure Program Management Office West.

⁸²⁸ Jacobson, K.C., M.R. Arkoosh, A.N. Kagley, E.R. Clemons, and T.K. Collier, 2003. Cumulative Effects of Natural and Anthropogenic Stress on Immune Function and Disease Resistance in Juvenile Chinook Salmon, *Journal of Aquatic Animal Health*, 15: 1-12.

⁸²⁹ Landhal, J.T., L.L. Johnson, J.E. Stein, T.K. Collier, and U. Varanasi, 1997. Approaches for determining affects of pollution on fish populations in Puget Sound. *Transactions of the American Fisheries Society* 126: 519-535.

⁸³⁰ US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001.

⁸³¹ US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001; Appendix F.

contamination resulting from routine maintenance dredging by requiring that dredging occur during established work windows when sensitive fish species are less likely to be present, and (2) mandating application of BMPs to control the distribution of sediments disturbed by the dredging activities. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact BI-20: Wildlife Movement

Impact of Candlestick Point

Impact BI-20a Implementation of the Project at Candlestick Point would not interfere substantially with the movement of resident or migratory bird species by increasing collision hazards and the amount of artificial lighting. (Less than Significant with Mitigation) [Criterion N.d]

The Project would be located along the Pacific Flyway for migratory birds. Migrating birds, such as songbirds, can be affected by human-built structures because of their propensity to migrate at night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions.⁸³² In addition, birds migrating at night are strongly attracted to sources of artificial light, particularly during periods of inclement weather.⁸³³ Exposure to a light field at night can cause alteration of a straight flight path, and the change in flight path would keep the bird near the light source longer than if the flight path remained straight.⁸³⁴ Brightly lit buildings can confuse migrating birds, trapping them in the bright light, which they are reluctant to fly out of, until they are exhausted or collide with a building.⁸³⁵ Confused by artificial lights, blinded by the weather, and unable to see glass, large numbers of birds have been documented being injured or killed by colliding with buildings in eastern and midwestern North America.⁸³⁶ Summaries of documented mortality from bird collisions have almost invariably focused on mortality in those regions, however, and large-scale mortality at buildings on the West Coast has not been reported.^{837,838}

At Candlestick Point, residential towers would range from 200 to 420 feet in height and the majority of local bird movement would be expected to be along the shoreline of San Francisco Bay, especially for shorebirds, as they move from foraging habitat to perching or roosting habitats in response to changes in the tide. Because the existing structures are relatively low (i.e., Candlestick Park stadium), the risk of bird strikes under existing conditions is expected to be minimal. New buildings from 200 to 420 feet in height would constitute a substantial increase in obstacles within flight paths when compared to existing conditions. The Project would create bird strike hazards at elevations that do not currently exist. With

⁸³² Gauthreaux, S.A. Jr. and C. Belser., *Ecological Consequences of Artificial Night Lighting: Effects of Artificial Night Lighting on Migrating Birds*, Island Press, Washington, 2006.

⁸³³ Ibid.

⁸³⁴ Ibid.

⁸³⁵ Keyes, T., *Building Bird Strike Study*, The Citizen Scientist, Non-game-Endangered Wildlife Program, 2005.

⁸³⁶ Ogden, L.J., *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds*, Wildlife Damage Management, Internet Center for Fatal Light Awareness Program (FLAP), University of Nebraska, 1996.

⁸³⁷ Avery, M.L. 1979. Review of Avian Mortality due to Collisions with Manmade Structures. Wildlife Damage Management, Internet Center for Bird Control Seminars Proceedings.

⁸³⁸ Klem, D., Jr. 1990. Collisions between Birds and Windows: Mortality and Prevention. *Journal of Field Ornithology* 61:120-128.

structures 400 feet tall or taller and windy, often foggy conditions found along San Francisco Bay, the risk of collision for birds would increase. Therefore, the Project could result in the creation of a new strike hazard for migrating birds that could result in loss of substantial numbers of birds over the life of the Project. Additionally, operating effects associated with the lighting of the towers can alter the flight patterns of migratory birds and potentially increase bird strike collisions with the tall buildings.

Although large-scale injury or mortality of birds due to collisions with buildings has not been reported from the West Coast, there is some potential for such mortality to occur in the absence of mitigation measures. Because of these potential effects, the Project is considered to have a potentially significant impact to migratory birds.

To reduce these impacts the following mitigation measures would be implemented.

MM BI-20a.1 Lighting Measures to Reduce Impacts to Birds. During design of any building greater than 100 feet tall, the Project Applicant and architect shall consult with a qualified biologist experienced with bird strikes and building/lighting design issues (as approved by the City/Agency) to identify lighting-related measures to minimize the effects of the building's lighting on birds. Such measures, which may include the following and/or other measures, will be incorporated into the building's design and operation.

- *Use strobe or flashing lights in place of continuously burning lights for obstruction lighting. Use flashing white lights rather than continuous light, red light, or rotating beams.*
- *Install shields onto light sources not necessary for air traffic to direct light towards the ground.*
- *Extinguish all exterior lighting (i.e., rooftop floods, perimeter spots) not required for public safety.*
- *When interior or exterior lights must be left on at night, the operator of the buildings shall examine and adopt alternatives to bright, all-night, floor-wide lighting, which may include:*
 - > *Installing motion-sensitive lighting.*
 - > *Using desk lamps and task lighting.*
 - > *Reprogramming timers.*
 - > *Use of lower-intensity lighting.*
- *Windows or window treatments that reduce transmission of light out of the building will be implemented to the extent feasible.*
- *Educational materials will be provided to building occupants encouraging them to minimize light transmission from windows, especially during peak spring and fall migratory periods, by turning off unnecessary lighting and/or closing drapes and blinds at night.*
- *A report of the lighting alternatives considered and adopted shall be provided to the City/Agency for review and approval prior to construction. The City/Agency shall ensure that lighting-related measures to reduce the risk of bird collisions have been incorporated into the design of such buildings to the extent practicable.*

MM BI-20a.2 Building Design Measures to Minimize Bird Strike Risk. During design of any building greater than 100 feet tall, the Project Applicant and architect will consult with a qualified biologist experienced with bird strikes and building/lighting design issues (as approved by the City/Agency) to identify measures related to the external appearance of the building to minimize the risk of bird strikes. Such

measures, which may include the following and/or other measures, will be incorporated into the building's design.

- *Use non-reflective tinted glass.*
- *Use window films to make windows visible to birds from the outside.*
- *Use external surfaces/designs that “break up” reflective surfaces.*
- *Place bird attractants, such as bird feeders and baths, at least 3 feet and preferably 30 feet or more from windows in order to reduce collision mortality.*
- *A report of the design measures considered and adopted shall be provided to the City/Agency for review and approval prior to construction. The City/Agency shall ensure that building design-related measures to reduce the risk of bird collisions have been incorporated to the extent practicable.*

Measures such as these have been recommended by a number of authors and organizations to reduce the potential for avian collisions with buildings.^{839,840,841,842,843,844} As discussed by Klem, “there are many solutions that effectively reduce or eliminate bird strikes” at buildings,⁸⁴⁵ and mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating these solutions. Specifically, these measures would reduce the incidence of bird strikes by requiring operational methods to reduce the effects of artificial lighting; making the structure (especially the glass surfaces) more visible from the outside with the use of external window coverings; and creating non-reflective or interference zones on or inside the glass. These measures are promoted in eastern and midwestern cities such as Toronto, Chicago, and New York City where avian collisions with buildings have been much better documented than on the West Coast, and implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact of Hunters Point Shipyard Phase II

Impact BI-20b Implementation of the Project at HPS Phase II would not interfere substantially with the movement of resident or migratory bird species by increasing collision hazards and the amount of artificial lighting. (Less than Significant with Mitigation) [Criterion N.d]

Within HPS Phase II, the towers would range from 240 to 350 feet in height, and the 49ers Stadium would be up to 156 feet in height with the top of the stadium light towers at 192 feet. Migrating birds such as songbirds can be affected by human-built structures because of their propensity to migrate at

⁸³⁹ Lights Out San Francisco. Golden Gate Audubon Society.

http://www.goldengateaudubon.org/html/conservation/lightsoutsf/lightsoutsf_main.htm.

⁸⁴⁰ Klem, D., Jr. Collisions between Birds and Windows: Mortality and Prevention. *Journal of Field Ornithology* 61:120-128.

⁸⁴¹ New York City Audubon. 2007. Bird-Safe Building Guidelines.

⁸⁴² Doeker, R. Bird-Safe Design Practices. www.birdsandbuildings.org.

⁸⁴³ Bates, R. 2008. Building Bird Strike Minimization: Analysis of Applicable Technologies. Kieran Timberlake Associates.

⁸⁴⁴ City of Toronto Green Development Standard. 2007. Bird-Friendly Development Guidelines.

⁸⁴⁵ Klem, D., Jr. Sheet Glass: An Invisible and Lethal Hazard for Birds. <http://www.windowcollisions.info/public/WK-Policy-Stat-Handout-03.pdf>.

night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions. Both tall structures and residential windows provide collision hazards to migrating birds. A majority of bird strikes occur when birds do not recognize windows on buildings. Thus, operation of the towers and stadium would pose collision hazards to migratory birds as effects associated with the lighting of the towers can alter the flight patterns of migratory birds and substantially increase bird strike collisions with the structures. As discussed under Impact BI-20a, large-scale avian injury or mortality due to bird strikes has not been documented at buildings on the West Coast as it has in eastern and midwestern North America. However, due to the potential for bird strikes at tall buildings on HPS Phase II, this would be a potentially significant impact.

Implementation of mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating birds to less-than-significant levels by incorporating design features that would help minimize bird strike, including using operation methods to reduce the effects of artificial lighting; making the structure, especially the glass surfaces, more visible from the outside with the use of external window coverings; and the creation of non-reflective or interference zones on or inside the glass. Consequently, implementation of these mitigation measures would reduce this impact to a less-than-significant level.

Impact BI-21: Local Plans and Policies

Impact of Candlestick Point

Impact BI-21a **Implementation of the Project at Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant With Mitigation) [Criterion N.e]**

As discussed in the consistency analysis for local policies in the Regulatory discussion above, operation of Candlestick Point would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. In addition, the City has adopted an Urban Forestry Ordinance and Section 143 of the Planning Code to protect trees as a significant resource to the community, and as discussed in Impact BI-14a, the Project's construction-related effects would comply with the Urban Forestry Ordinance to the extent applicable and, with mitigation measure MM BI-14a, would ensure that the Project is constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, and the impact would be less than significant.

Impact of Hunters Point Shipyard Phase II

Impact BI-21b **Implementation of the Project at HPS Phase II would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant With Mitigation) [Criterion N.e]**

As discussed in the consistency analysis for local policies in the Regulatory discussion above, operation of HPS Phase II would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. Further, as discussed in Impact BI-14b, with implementation of mitigation measure

MM BI-14a, the Project's construction-related effects would be consistent with the policies set forth in the City's Urban Forestry Ordinance and policies reflected in Section 143 of the Planning Code for the protection of trees. Consequently, the operation of HPS Phase II would not conflict with any local policies or ordinances protecting biological resources, and the impact would be less than significant.

■ Project Impacts

The impact discussion below addresses the impacts of the overall Project, which is the combined development and operation of Candlestick Point and HPS Phase II, including the Yosemite Slough bridge.

Impact BI-22: Special-Status and/or Legally Protected Species

Impact BI-22 **Implementation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, by the CDFG, USFWS, or NMFS. (Less than Significant with Mitigation) [Criterion N.a]**

The Project would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt) (refer to Table III.N-5). The Project also has the potential to affect designated critical habitat of the green sturgeon and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. In addition, Project activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the MBTA and *California Fish and Game Code*.

Implementation of ecological Project design features described in the Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) would result in multiple measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the Project design components would remove invasive species; restore, preserve, and enhance wetland, aquatic and grassland habitats; create stormwater treatment wetlands; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. For areas that cannot be avoided, the Project Applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) the impacted areas of eelgrass and monitor them for success over sequential years, thus replacing impacted habitat and increasing its abundance regionally. Residual adverse effects would be less than significant with this mitigation.

Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Potential impacts to burrowing owls would

be mitigated through the conservation of lands as detailed in the *California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines*, and Project-related open space preservation. Residual adverse effects would be less than significant with this mitigation.

Impacts to foraging raptors would be beneficial due to the removal of invasive plants and improvement of existing parkland through the restoration and management of native-dominated grassland. Only 5.13 acres of the lands impacted on Candlestick Point provide non-native grassland habitat that serves as foraging habitat for raptors. In addition, the Project would mitigate impacts to 43 acres of non-native grassland that provides raptor foraging habitat on HPS Phase II by restoring an equivalent amount of higher-quality native-dominated grassland specifically managed for grassland-associated species (see mitigation measure MM BI-7b). These areas would provide high-quality foraging habitat, and a net increase in the quality of raptor foraging habitat would result.

Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring. Residual adverse effects would be less than significant with this mitigation.

Development of the Project would require in-water work associated with the shoreline treatments. All work would occur in relatively shallow water areas that are unlikely to support foraging special-status fish. Still, the NMFS has considered the entire Bay in the site vicinity to be designated critical habitat for the green sturgeon and Central California Coast steelhead, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by shoreline construction activities. Compensatory mitigation for Project impacts to aquatic habitat would be provided as described by mitigation measure MM BI-4a.1, and mitigation measure MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels. Further, a net increase of approximately 8 acres of new aquatic habitat as a result of removal of fill and structures would more than offset the loss of open water habitat.

Impacts to western red bats would be less than significant as, although the removal of large trees could lead to disturbance and mortality of a very limited number of individuals of this species, the loss or disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. In addition, implementation of the Project's ecological design features, as described in the Draft Parks, Open Space, and Habitat Concept Plan, would result in increased habitat for this species.

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to less-than-significant by (1) determining the distribution of oyster populations within the new marina area, and (2) preparing a modeling study of potential sediment plume generation and assessing the

potential for that plume to reach oysters, and using that model to guide site-specific mitigation for sedimentation impacts to oysters that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat. Implementation of mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to the species. Residual adverse effects would be less than significant with implementation of this mitigation measure.

The Project, with implementation of the above identified mitigation measures and ecological design features, would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Potential adverse effects would be reduced to less-than-significant levels.

Impact BI-23: Sensitive Habitats

Impact BI-23 **Implementation of the Project would not have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, or regulations by the CDFG, USFWS, or NMFS. (Less than Significant with Mitigation) [*Criterion N.b*]**

No riparian habitat occupies the Study Area and the only sensitive habitats other than wetlands and aquatic habitats (discussed in Impact BI-24) are eelgrass and areas designated as EFH.

A small area of eelgrass was reported along the north shore of the South Basin directly across from Candlestick Point and a second area was identified east of the northern end of Earl Street. Together these areas make up approximately 1.99 acres of this habitat. Permanent removal of this habitat or substantial loss of productivity, such that it would no longer be ecologically functional, would result in the loss of a sensitive natural community, which would be a substantial adverse effect.

The Bay in the Project vicinity has been designated EFH for the Pacific Coast Salmon Plan, Coast Pelagics Fishery Management Plan, and Pacific Groundfish Fishery Management Plan. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered to result in changes to designated EFH. Installation of shoreline treatments its modification to EFH (i.e., installation of rock fill material to buttress existing bulkheads) would be considered a substantial adverse effect. To reduce these potential construction-related impacts to less-than-significant levels, mitigation measures MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would be implemented. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to EFH by (1) determining the distribution of oyster populations within the new marina area, and (2) preparing a modeling study of potential sediment plume generation and assessing the potential for that plume to reach oysters, and using that model to guide site-specific mitigation for sedimentation impacts to EFH that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat. Implementation of mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to EFH.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce potential Project effects on eelgrass by requiring surveys for and avoidance of this habitat. For areas that cannot be avoided, the Project Applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) the impacted areas of eelgrass and monitor them for success over a 5-year period, thus, replacing impacted habitat and increasing its abundance regionally. Residual impacts would be less than significant with implementation of this mitigation measure. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH to less-than-significant levels by (1) reducing the effects of increased contamination resulting from routine maintenance dredging by requiring that dredging occur during established work windows when sensitive fish species are less likely to be present, and (2) mandating application of BMPs to control the distribution of sediments disturbed by the dredging activities.

With implementation of the identified mitigation measures, the Project's potential adverse effects to sensitive natural communities identified in local or regional plans, policies, regulations or by the CDFG, NMFS, or USFWS would be reduced to a less-than-significant level.

Impact BI-24: Wetlands and Jurisdictional Waters

Impact BI-24 **Implementation of the Project would not have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) [*Criterion N.c*]**

Table III.N-4 depicts on-site and off-site impact acreages resulting from site grading, materials laydown, facilities construction, vegetation removal, and installation of shoreline treatments for Candlestick Point, HPS Phase II, and Yosemite Slough bridge. Project implementation would permanently impact 0.64 acre of wetlands; including 0.17 acre of freshwater wetland, 0.41 acre of tidal salt marsh and 0.06 acre of non-tidal salt marsh. In addition, Project implementation would permanently impact 24.96 acres of Section 404 other waters. The Project would temporarily impact 0.11 acre of jurisdictional wetlands and 2.77 acres of Section 404 other waters. Temporary impacts are short term because, after construction, any areas disturbed would be restored to pre-construction conditions that would have equal or greater habitat functions and values. Approximately 3-4 acres of impacts to jurisdictional wetlands and other waters would result from the placement of marsh soils and other materials along portions of the shorelines of Candlestick Point and the southern edge of HPS Phase II to promote the development of a strip of tidal wetlands along the shoreline. Although such impacts are considered permanent, since they would modify these areas relative to their existing condition, these impacts are considered self-mitigating in that they would enhance habitat conditions relative to both the existing shoreline and, along the southern edge of HPS, the riprap revetment that is expected to be constructed by the Navy following completion of remediation. Further, a net increase of approximately 8.09 acres of open water would occur as a result of the Project.

Of the 28.48 acres of total impacts to jurisdictional wetlands and other waters of the US that would occur as a result of the Project, jurisdictional areas that would be completely lost (i.e., converted to non-jurisdictional habitats) total only approximately 5.26 acres. This loss of habitat would occur primarily due

to construction of the abutments of the Yosemite Slough bridge, along the northern approach road to the bridge, where a freshwater wetland is located in the west-central part of the site, and where construction of new breakwaters, a floating dock, and a gangway would occur at the marina. Approximately 12 acres would result from fill placed for drydock repairs, buttressing required to support existing pier walls and bulkheads, or other shoreline improvements.

The Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately 8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS and portions of Candlestick Point is responsible for approximately 3 to 4 acres of impacts, approximately 11 to 12 acres of the total 28.48 acres of impacts to jurisdictional areas on the Project site would result from activities that would enhance ecological conditions along the shoreline.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands defined that would result in a net loss of these areas would be considered a significant impact. Conformance with the CWA (via Sections 404 and 401 certification), Section 10 of the *Rivers and Harbors Act*, BCDC permitting requirements, and the NPDES regulations would ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the USACE, SFRWQCB, and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction Best Management Practices to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* would be reduced to a less-than-significant level.

Impact BI-25: Wildlife Movement

Impact BI-25 **Implementation of the Project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site. (Less than Significant with Mitigation) [Criterion N.d]**

The Study Area is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Study Area.

The majority of the bird species observed in the Study Area were terrestrial species, followed by shorebirds, waterfowl, gulls and terns, and raptors (in descending order). Very few Neotropical and other

long-distance migrant songbirds were recorded during the survey. However, implementation of the Project would place new residential towers and a stadium with light towers along a portion of the San Francisco Bay shoreline. The increase in strike hazards from the tall buildings would be considered a potentially significant impact to migratory birds. The lighted stadium could also affect birds migrating at night, since lighting can disorient migrating birds, although lighting from the new stadium is unlikely to result in a substantially greater effect than lighting from the existing stadium on Candlestick Point.

With respect to aquatic species, the Project does not contain any substantial migratory fish pathways such as anadromous fish streams, although migratory fish do move through the open water and, possibly, into Yosemite Slough as they do throughout all of the San Francisco Bay estuary. The Project would not substantially interrupt any fish movements that currently occur. However, construction of breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact them such that productivity and survival of these habitats would be substantially reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be considered a significant impact due to the ecological importance of these habitats to aquatic species. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass by requiring surveys for and avoidance of this habitat. For areas that cannot be avoided, the applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) for impacted areas of eelgrass and monitor them for success over sequential years; thus, replacing impacted habitat and increasing its abundance regionally. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers and design measures to make the exteriors of buildings more readily visible to birds.

With implementation of the identified mitigation measures, impacts of the Project would be reduced to a less-than-significant level as the Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact BI-26: Local Plans and Policies

Impact BI-26 Implementation of the Project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation) [Criterion N.e]

As discussed previously, the Project would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. However, construction activities associated with the Project could result in disturbance or loss of trees within DPW jurisdiction. These trees would be subject to the requirements of the *Public Works Code*, which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The Planning Code does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143.

Mitigation measure MM BI-14a would encourage the preservation of street trees and trees that are large enough to meet the size specification of significant trees in the *Public Works Code*, and would require the replacement of large trees that are removed. Further, it would require the planting of street trees consistent with the intent of the *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees at the Project site and in the community. The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. With implementation of mitigation measures MM BI-14a and MM BI-7b, the Project would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, and impacts would be less than significant.

The Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) includes the planting of an estimated 10,000 net new trees at the Project site and in the community, avoids removal of native trees where possible, and establishes new parkland and open space that would include a predominance of native species. Consequently, the Project would not conflict with any local policies or ordinances protecting biological resources, and overall impacts of the Project are expected to be beneficial.

■ Cumulative Impacts

The geographic context for the analysis of cumulative impacts to biological resources varies, depending on the specific threshold being analyzed. The appropriate context is described for each subsection. The past and present development is generally described in the Setting section of this chapter but may also include existing development around the shoreline of the San Francisco Bay, as described in the applicable geographic context for each criterion (refer to discussion below). Reasonably foreseeable development would include those cumulative projects that could be developed in the specified geographic area, as well as planned and in-process wetland restoration plans within the Bay area.⁸⁴⁶ The cumulative analysis in this section is grouped by Criteria N.a through N.e identified earlier in this chapter. Criteria N.a and N.b are analyzed together. Criteria N.f and N.e. are not analyzed, as the Project would have no impact on any Habitat Conservation Plan and a beneficial impact to local plans and policies.

⁸⁴⁶ South Bay Salt Pond Restoration Project Final Environmental Impact Statement/Environmental Impact Report. Report December 2007.

Effects on Candidate, Sensitive, or Special-Status Species, Riparian Habitat, or other Sensitive Natural Communities (Criteria N.a. and N.b)

The geographic context for the cumulative analysis of effects on sensitive species and sensitive natural communities is the San Francisco Bay shoreline (Region), defined north to south by the land mass and by the Carquinez Bridge on the east where I-80 crosses the Sacramento-San Joaquin Rivers at Vallejo, upstream of San Pablo Bay, and the Golden Gate Bridge on the west. This regional context contains some or all of the species and habitats identified in the Study Area. Past and present development is described in the Setting section of this chapter, along with other existing development on or adjacent to the Bay shoreline. Reasonably foreseeable development would consist of projects proposed or under construction along the shoreline of the San Francisco Bay that could affect the identified species, habitat, or sensitive natural community.

In general, cumulative projects within the Bay would include, but not be limited to new development, marinas, shoreline protection projects, flood protection projects in light of anticipated sea level rise, transportation projects, and restoration projects. These projects could involve removal and/or modification of areas that have the potential to contain special-status species and sensitive natural communities (wetlands are discussed in a separate impacts statement below). As development in the Region continues, habitat for and individuals of sensitive wildlife species native to the Region, including those species listed under federal and state ESAs and those individuals identified by state and federal resources agencies as species of concern, fully protected, or sensitive, would be lost through conversion of habitat to urbanized environment. Although more mobile species might be able to survive these changes in their environment by moving to new areas, less mobile species could simply be locally extirpated. With continued conversion of natural habitat to human use, the availability and accessibility of remaining natural habitats in this ecosystem would dwindle and those remaining natural areas may not be able to support additional plant or animal populations above their current carrying capacities. Thus, the conversion of plant and wildlife habitat on a Regional level would, therefore, result in a significant regional cumulative impact on special-status species and their habitats.

The terrestrial habitats within the Project site are of low quality to terrestrial wildlife species, consisting of urbanized areas, non-native annual grassland, and landscaped areas/ornamental plants. However, some areas of moderate to high-quality habitat such as salt marsh, mud flats, and seasonal freshwater wetland, which could support special-status species, would also be impacted. The Project would also affect designated critical habitat for green sturgeon and Central California Coast steelhead, and could possibly affect individuals of these and other listed fish species. Thus, the Project could directly or indirectly impact threatened and/or endangered species. Lastly, Project activities could occur within habitats of locally rare or sensitive species such as Pacific herring spawning habitat, eelgrass, Olympia oyster beds, and areas designated as EFH. Consequently, without mitigation the Project would contribute to a loss of regional biological resources through the incremental conversion of habitat for special-status species to human use.

The Project may be required to participate in mitigation plans approved by state and federal resource agencies (i.e., for green sturgeon, Central California Coast steelhead and possibly Chinook salmon and longfin smelt), which would replace lost habitat and preserve contiguous areas of habitat for these species. The Project would also implement ecological design features and mitigation measures specifically

designed to avoid, reduce, or mitigate impacts to special-status/sensitive species and their habitat and reduce the Project's contribution to the cumulative loss of these species and their habitats.

Implementation of the two ecological Project design features, as described in the Draft Parks, Open Space, and Habitat Concept Plan required by mitigation measure MM BI-7b, would result in multiple measures to avoid, limit, and mitigate impacts to special-status and legally protected species. Mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects on wetlands and aquatic habitats.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat and replacing, at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre), the impacted areas of eelgrass that cannot be avoided. Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Potential impacts to burrowing owls would be mitigated through the conservation of lands as detailed in the *California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines*, and Project-related open space preservation. Impacts to foraging raptors would be beneficial due to the Project's ecological enhancements as described in the Draft Parks, Open Space, and Habitat Concept Plan (i.e., removal of invasive plants and improvement of existing parkland through the restoration and management of native-dominated grasslands), and the requirements specified in mitigation measure MM BI-7b. Only 5.13 acres of the lands impacted on Candlestick Point provide non-native grassland habitat that serves as foraging habitat for raptors. In addition, the Project would mitigate impacts to 43 acres of non-native grassland that provides raptor foraging habitat on HPS Phase II by restoring an equivalent amount of higher-quality native-dominated grassland specifically managed for grassland-associated species. These areas would represent high-quality foraging habitat and would result in a net increase in the quality of raptor foraging habitat. The Project would impact designated green sturgeon and Central California Coast steelhead critical habitat. However, compensatory mitigation for impacts to aquatic habitat, which include habitat used by green sturgeon and Central California Coast steelhead, would be provided as described by mitigation measure MM BI-4a.1, mitigating impacts to proposed green sturgeon critical habitat and designated Central California Coast steelhead to less-than-significant levels. In addition, the Project would create approximately 8 acres of new aquatic habitat throughout the removal of structures and fill from aquatic habitats in the Study Area. The Bay in the Project vicinity has been designated EFH for the Pacific Coast Salmon Plan, Coast Pelagics Fishery Management Plan, and Pacific Groundfish Fishery Management Plan. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered a substantial adverse effect on designated EFH. Any loss of EFH that would result from construction activities would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1), and mitigation measures MM BI-4a.2, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would also reduce or minimize potential adverse effects to EFH.

Consequently, with implementation of the proposed mitigation and ecological Project components the Project would mitigate any contributions to significant cumulative impact to candidate, sensitive, or special-status species, riparian habitat, or other sensitive natural communities. The Project would thus not make a cumulatively considerable contribution to a regionally significant cumulative impact.

Effects on Federally Protected Wetlands and Jurisdictional Waters (Criterion N.c)

The geographic context for the cumulative analysis of effects on wetlands or navigable waters is the San Francisco Bay shoreline and its adjacent wetlands, defined north to south by the land mass and by the Carquinez Bridge on the east where I-80 crosses the Sacramento-San Joaquin Rivers at Vallejo, upstream of San Pablo Bay, and the Golden Gate Bridge on the west. Past and present development is described in the Setting section of this chapter, along with other existing development on or adjacent to the Bay shoreline. Reasonably foreseeable development would consist of projects proposed or under construction along the shoreline of the San Francisco Bay that could affect federally protected wetlands or jurisdictional waters, either adversely (i.e., development projects) or beneficially (i.e., restoration projects). Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace them in the exact same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

More than 90 percent of historic tidal wetlands in the Bay Area have been lost to diking, draining, and filling.⁸⁴⁷ The South Bay supports some of the most important habitat remaining in the entire Bay Area for a number of wildlife species, in spite of the highly urbanized surrounding areas and the dramatic alteration of the Bay itself for shipping, salt production, and urban development.⁸⁴⁸ Wetland and jurisdictional waters restoration projects within the Bay area extensive, with approximately 40,000 acres of wetlands are either in progress or planned.⁸⁴⁹ Although these restoration projects are attempting to reduce the cumulative loss of these habitats within the Region, the large historical loss of these areas has resulted in a cumulatively significant loss of wetlands and jurisdictional waters within the Region.

As detailed in Table III.N-4, the Project would permanently impact 0.64 acre of wetlands and 24.96 acres of Section 404 other waters. The Project may also permanently impact 0.0992 acre and temporarily impact 0.1532 acre of a proposed Navy wetland mitigation site (refer to Figure III.N-6), if the mitigation site is constructed prior to construction of the Yosemite Slough bridge and its approaches. Temporary Project impacts would occur to 0.11 acre of wetlands and 2.77 acres of Section 404 other waters. Consequently, without mitigation of these impacts and compliance with regulations governing wetlands and jurisdictional waters, the Project would contribute to loss of wetlands and jurisdictional waters within the Region.

However, the Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately

⁸⁴⁷ Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. US Environmental Protection Agency, San Francisco, California/San Francisco Bay Regional Water Quality Control Board, Oakland, California.

⁸⁴⁸ Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. US Environmental Protection Agency, San Francisco, California/San Francisco Bay Regional Water Quality Control Board, Oakland, California.

⁸⁴⁹ South Bay Salt Pond Restoration Project Final Environmental Impact Statement/Report. December 2007.

8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS and portions of Candlestick Point is responsible for approximately 3 to 4 acres of impacts, approximately 11 to 12 acres of the total 28.48 acres of impacts to jurisdictional areas on the Project site would result from activities that would enhance ecological conditions along the shoreline.

Any alterations of, or discharges into, waters of the United States, including Section 404 wetlands must be in conformance with the CWA via Section 404 permitting and Section 401 certification prior to any grading or construction that may impact jurisdictional area(s), as appropriate. Additionally, a SAA per Section 1600 of the *California Fish and Game Code* would be required for removal of any CDFG-jurisdictional areas, if present. Also, runoff produced during and after construction is subject to NPDES and local water quality and runoff standards. Compensation for impacts to wetlands and jurisdictional waters are developed as a part of the permitting process with the USACE, or for non-USACE-jurisdictional wetlands, during permitting through the SFRWQCB, BCDC, and/or CDFG. The exact mitigation ratio is variable, and would be based on the type and value of the wetlands or jurisdictional waters affected, and would be established during the permitting process; however, at a minimum, compensation would result in compliance with the state⁸⁵⁰ and federal⁸⁵¹ “no net loss of wetlands” policies, resulting in a minimum 1:1 mitigation ratio. Therefore, minimizing impacts to jurisdictional wetlands and other waters; compensating for impacts to these habitats; securing a SAA from the CDFG (if applicable) and 404 and 401 permits under the CWA; and compliance with the federal and state “no net loss of wetlands” policy would protect the hydrology and ecology of the wetlands and jurisdictional waters within the Project site and the Bay and its adjacent wetlands. Impacts from the Project to these habitats would thus be fully compensated. Therefore, because no long-term net loss of wetland resources would be attributable to the Project, development of the Project would not make a cumulatively considerable contribution to the regionally significant cumulative impact.

Interfere Substantially with Movement of Native Fish or Wildlife Species or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of a Native Wildlife Nursery Site (Criterion N.d)

The geographic context for the analysis of cumulative impacts on movement of native fish or wildlife species is the San Francisco Bay, both the aquatic portion and adjacent lands, which represents an area of possible connectivity or relationship in terms of wildlife movement. This area includes the shoreline and extends out into the Bay to include any area of in-water construction. The past and present development is described in the Setting section of this chapter, representing the baseline conditions for the evaluation of cumulative impacts. Reasonably foreseeable development would be those cumulative projects that could be developed in the specified geographic area.

Development over the past 150 years has encroached upon and displaced biological resources throughout the City of San Francisco and the areas surrounding the Bay. The conversion of grassland, oak woodland, riparian woodland, riverine, wetland, and other native habitats to urban and suburban development has not only resulted in considerable habitat loss, but has resulted in habitat fragmentation such that native non-avian wildlife species occurring in intact patches of native terrestrial habitat cannot

⁸⁵⁰ <http://ceres.ca.gov/wetlands/policies/governor.html>.

⁸⁵¹ <http://www.fws.gov/policy/660fw1.html>.

readily access other intact terrestrial habitat patches. The lack of connectivity between native habitat patches has rendered many terrestrial species once common to those habitat patches susceptible to local extinction. In addition the conversion of the Bay's wetlands, eelgrass, and other aquatic habitats to other habitats and/or uses has resulted in these potential nursery sites being no longer available to the species that would have historically utilized them. Consequently, the conversion of open areas, both terrestrial and aquatic, on a Regional level as a result of cumulative development would result in a regionally significant cumulative impact on wildlife movement corridors and nursery sites.

Wildlife Movement

The Study Area does not include any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and contains no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways. There would be no impact to regional terrestrial (non-avian) wildlife movement. The Project would be located along the Pacific Flyway for migratory birds. Migrating birds, such as songbirds, can be affected by human-built structures because of their propensity to migrate at night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions. This is a potentially significant cumulative impact. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the Project's effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operation methods to reduce the effects of artificial lighting; making the structure, especially the glass surfaces, more visible from the outside with the use of external window coverings; and the creation of non-reflective or interference zones on or inside the glass. By implementing these measures, the design of towers that would be constructed in the Project area would be more "bird-friendly", thus resulting in less risk of avian collisions, than the numerous tall buildings that have been constructed in the region that were not designed and/or are not operated with minimizing avian collision risk in mind. Consequently, implementation of the Project would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors and the Project would not make a considerable contribution to this cumulative impact.

Nursery Sites

Construction of the Project and the cumulative projects on the shoreline or in-water in the vicinity of eelgrass beds could remove them or indirectly impact them such that productivity and survival of these habitats would be reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be a significant impact if it would impede the use of the eelgrass habitat. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce potential Project effects on eelgrass by requiring surveys for and avoidance of this habitat. For areas that cannot be avoided, this habitat would be replaced at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) thus, replacing impacted habitat. Consequently, implementation of the Project would not impede the use of native wildlife nursery sites and the Project would not make a considerable contribution to this cumulative impact.

Overall, the Project's contribution to the cumulative impact on wildlife movement and wildlife nursery sites would be reduced to less than considerable by implementation of the above- mentioned mitigation measures. The Project's cumulative impact would, therefore, be less than significant.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
PLANTS				
Adobe sanicle	<i>Sanicula maritima</i>	none/SR/1B.1	Chaparral, coastal prairie, meadows and seeps, and valley and foothill grasslands in association with clay or serpentine soils. 98–787 feet (30–240 meters); blooms February–May	Not Likely. Suitable habitat for this species occurs in the Study Area. However, there are no recorded occurrences of this species within 5 miles of the Study Area, and none were observed during rare plant surveys of suitable habitat in 2007 and 2008 by PBS&J.
Alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	none/none/1B.2	Playas, valley and foothill grassland with adobe clay, and vernal pools with alkaline soils. 0–2051 feet (0–625 meters); blooms May–September.	Not Likely. Suitable habitat for this species does not occur in the Study Area.
Arcuate bush-mallow	<i>Malacothamnus arcuatus</i>	none/none/1B.2	Chaparral and cismontane woodland. 82–295 feet (25–90 meters); blooms April–September.	Not Likely. Suitable habitat for this species does not occur in the Study Area.
Beach layia	<i>Layia carnosa</i>	FE/SE/1B.1	Coastal dunes and coastal scrub with sandy soils. 0–197 feet (0–60 meters); blooms March–July.	Not Likely. Coastal scrub does not occur in the Study Area. This species was not observed during surveys conducted by PBS&J in 2007 and 2008.
Bent-flowered fiddleneck	<i>Amsinckia lunaris</i>	none/none/1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland habitats. 10–1,640 feet (3– 500 meters); blooms March–June	Not Likely. Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of <i>Amsinckia</i> were observed during floristic surveys conducted in 2005 by CNPS ⁸⁵² and in 2007 and 2008 by PBS&J.
Big-scale balsamroot	<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	none/none/1B.2	Occurs in chaparral, cismontane woodland, and valley and foothill grassland, sometimes in serpentine soil substrates at elevations ranging from 295–4,593 feet (90–1,400 meters); blooms March–June.	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Balsamorhiza</i> were observed during floristic surveys conducted in 2005 by CNPS ⁸⁵³ and in 2007 and 2008 by PBS&J.
Blue coast gilia	<i>Gilia capitata</i> ssp. <i>chamissonis</i>	none/none/1B.1	Coastal dunes and coastal scrub. 7–656 feet (2–200 meters); blooms April–July.	Not Likely. Coastal scrub does not occur in the Study Area. There are no recorded occurrences of this species within 5 miles of the Study Area.
Bristly sedge	<i>Carex comosa</i>	none/none/2.1	Coastal prairie, marshes and swamps (along lake margins), and valley and foothill grassland. 0–2,051 feet (0–625 meters); blooms May–September.	Not Likely. Marsh habitat in the Study Area has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007. ⁸⁵⁴

⁸⁵² California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.

⁸⁵³ Ibid.

⁸⁵⁴ Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
California seablite	<i>Suaeda californica</i>	FE/none/1B.1	Marshes and swamps with coastal salt marsh. 0–49 feet (0–15 meters); blooms July–October.	Not Likely. Marsh habitat in the Study Area has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007. ⁸⁵⁵
Coastal triquetrella	<i>Triquetrella californica</i>	none/none/1B.2	A moss that occurs in coastal bluff scrub and coastal scrub. 33–328 feet (10–100 meters).	Not Likely. Coastal scrub does not occur in the Study Area.
Compact cobwebby thistle	<i>Cirsium occidentale</i> var. <i>compactum</i>	none/none/1B.2	Chaparral, coastal dunes, coastal prairie, and costal scrub. 16–492 feet (5–150 meters); blooms April–June.	Not Likely. Coastal scrub does not occur in the Study Area. No native species of <i>Cirsium</i> were observed during floristic surveys conducted in 2005 by CNPS ⁸⁵⁶ and in 2007 and 2008 by PBS&J.
Crystal Springs lessingia	<i>Lessingia arachnoidea</i>	none/none/1B.2	Cismontane woodland, coastal scrub, and valley and foothill grassland habitats, in association with serpentinite soils along roadsides. 197–656 feet (60–200 meters); blooms July–October	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Lessingia</i> were observed during floristic surveys conducted by CNPS ⁸⁵⁷ and PBS&J in 2007 and 2008.
Diablo helianthella	<i>Helianthella castanea</i>	none/none/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. 197–4,265 feet (60–1,300 meters); blooms March–June.	Not Likely. Chaparral or oak woodland absent in Study Area.
Fountain thistle	<i>Cirsium fontinale</i> var. <i>fontinale</i>	FE/SE/1B.1	Openings in chaparral habitats; valley and foothill grassland habitats in association with serpentinite seeps. 295–574 feet (90–175 meters); blooms June–October	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of <i>Cirsium</i> were observed during floristic surveys conducted by CNPS ⁸⁵⁸ and PBS&J in 2007 and 2008.
Fragrant fritillary	<i>Fritillaria liliacea</i>	none/none/1B.2	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland habitats often in association with serpentinite soils. 10–1,345 feet (3–410 meters); blooms February–April	Not Likely. Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of <i>Fritillaria</i> were observed during floristic surveys conducted by CNPS ⁸⁵⁹ and PBS&J in 2007 and 2008.

⁸⁵⁵ Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.

⁸⁵⁶ California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.

⁸⁵⁷ Ibid.

⁸⁵⁸ Ibid.

⁸⁵⁹ Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Franciscan manzanita	<i>Arctostaphylos hookeri</i> ssp. <i>franciscana</i>	none/none/1A	Coastal scrub with serpentinite soil substrates. 197–984 feet (60–300 meters); blooms February–April.	Not Likely. Serpentinite soil substrates do not occur within Study Area. No recorded occurrences of this species within 5 miles of the Study Area. No species of <i>Arctostaphylos</i> were observed during surveys conducted by Caltrans in 2007 ⁸⁶⁰ and PBS&J in 2007 and 2008.
Franciscan onion	<i>Allium peninsulare</i> var. <i>franciscanum</i>	SLC/none/1B.2	Clay and serpentine soils on dry hillsides in woodlands and valley and foothill grasslands 170–984 feet (52–300 meters); blooms May–June.	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Allium</i> were observed during floristic surveys conducted by CNPS ⁸⁶¹ and PBS&J in 2007 and 2008.
Franciscan thistle	<i>Cirsium andrewsii</i>	none/none/1B.2	Broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub habitats, often in association with serpentinite soils. 0–492 feet (0–150 meters); blooms March–July	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of <i>Cirsium</i> were observed during floristic surveys conducted by CNPS ⁸⁶² and PBS&J in 2007 and 2008.
Hillsborough chocolate lily	<i>Fritillaria biflora</i> var. <i>ineziana</i>	none/none/1B.1	Cismontane woodland and valley and foothill grassland habitats in association with serpentinite soils. 492 feet (150 meters); blooms March–April	Not Likely. Known only from the Hillsborough area. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of <i>Fritillaria</i> were observed during floristic surveys conducted by CNPS ⁸⁶³ and PBS&J in 2007 and 2008.
Kellogg's horkelia	<i>Horkelia cuneata</i> ssp. <i>sericea</i>	none/none/1B.1	Closed-cone coniferous forest, chaparral, coastal dunes, and coastal scrub with sandy or gravelly openings. 33–656 feet (10–200 meters); blooms April–September.	Not Likely. Coastal scrub does not occur in the Study Area.
Marin western flax	<i>Hesperolinon congestum</i>	FT/ST/1B.1	Chaparral and valley and foothill grassland habitats in association with serpentinite soils. 16–1214 feet (5–370 meters); blooms April–July	Not Likely. Although there are recorded occurrences of this species within 5 miles of the Study Area, no species of <i>Hesperolinon</i> were observed during floristic surveys conducted by CNPS and PBS&J in 2007 and 2008.

⁸⁶⁰ Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

⁸⁶¹ California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.

⁸⁶² Ibid.

⁸⁶³ Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Montara manzanita	<i>Arctostaphylos montaraensis</i>	none/none/1B.2	Chaparral and coastal scrub. 492–1,640 feet (150–500 meters); blooms January–March.	Not Likely. Coastal scrub does not occur in the Study Area. No species of <i>Arctostaphylos</i> were observed during surveys conducted by Caltrans in 2007 ⁸⁶⁴ and PBS&J in 2007 and 2008.
Most beautiful jewel-flower	<i>Streptanthus albidus</i> ssp. <i>permoenus</i>	none/none/1B.2	Chaparral, cismontane woodland, valley and foothill grasslands, often on serpentine soils. 361–3,281 feet (110–1,000 meters); blooms April–June.	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Streptanthus</i> were observed during floristic surveys conducted by CNPS and PBS&J in 2007 and 2008.
Pacific manzanita	<i>Arctostaphylos pacifica</i>	none/SE/1B.2	Chaparral and coastal scrub. 1,083 feet (330 meters); blooms February–April.	Not Likely. Coastal scrub does not occur in the Study Area. Species of <i>Arctostaphylos</i> not identified during surveys.
Point Reyes bird's-beak	<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	none/none/1B.2	Coastal salt marsh. 0–33 feet (0–10 meters); blooms June–October.	Not Likely. Marsh habitat in the Study Area is of marginal quality and has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007. ⁸⁶⁵ Observed in adjacent off-site locations to the Yosemite Slough area according to the Yosemite Slough IS/MND. ⁸⁶⁶ Was not observed in the Yosemite Slough area during 2005 surveys conducted by LSA.
Presidio clarkia	<i>Clarkia franciscana</i>	FE/SE/1B.1	Occurs in coastal scrub and valley and foothill grassland, often on serpentine soils. 82–1,099 feet (25–335 meters); blooms May–July	Not Likely. Known from fewer than five occurrences. The closest two known populations are in the San Francisco Presidio approximately 6 miles northwest. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Clarkia</i> were observed during floristic surveys conducted by CNPS ⁸⁶⁷ and PBS&J in 2007 and 2008.
Presidio manzanita	<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i>	FE/SE/1B.1	Chaparral, coastal prairie, and coastal scrub with serpentinite outcrops. 148–705 feet (45–215 meters); blooms February–March.	Not Likely. Serpentinite soil substrates do not occur within Study Area; however, there are no recorded occurrences of this species within 5 miles of the Study Area. Species of <i>Arctostaphylos</i> not identified during surveys.

⁸⁶⁴ Jones & Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

⁸⁶⁵ Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.

⁸⁶⁶ California State Parks Foundation, Draft Initial Study –Mitigated Negative Declaration for the Candlestick Point State Recreation Area Yosemite Slough Restoration Project, December 2005.

⁸⁶⁷ California Native Plant Society, California Native Plant Society, Yerba Buena Chapter, Electronic plant list; R. Hunter and J. Sigg, 2005.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Robust spineflower	<i>Chorizanthe robusta</i> var. <i>robusta</i>	FE/none/1B.1	Chaparral, cismontane woodlands (in openings), coastal dunes, coastal scrub with sandy or gravelly soil. 10–984 feet (3–300) meters; blooms April–September.	Not Likely. Coastal dunes are absent from the Study Area. Remnant dunes in the Study Area are disturbed habitat. This species was not observed during surveys conducted by PBS&J in 2007 and 2008.
Rose leptosiphon	<i>Leptosiphon rosaceus</i>	none/none/1B.1	Coastal bluff scrub. 0–328 feet (0–100 meters); blooms April–July.	Not Likely. Suitable habitat for this species does not occur in the Study Area.
San Bruno Mountain manzanita	<i>Arctostaphylos imbricata</i>	none/SE/1B.1	Chaparral and coastal scrub with rocky substrate. 902–1,214 feet (275–370 meters); blooms February–May.	Not Likely. Coastal scrub does not occur in the Study Area. Species of <i>Arctostaphylos</i> not identified during surveys.
San Francisco Bay spineflower	<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	none/none/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub with sandy soils. 10–705 feet (3–215 meters); blooms April–July (uncommon in August).	Not Likely. Coastal scrub does not occur in the Study Area.
San Francisco campion	<i>Silene vercunda</i> ssp. <i>verecunda</i>	none/none/1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland with sandy soil. 98–2,116 feet (30–645 meters); blooms March–June (uncommon in August).	Not Likely. Coastal scrub does not occur in the Study Area.
San Francisco Collinsia	<i>Collinsia multicolor</i>	none/none/1B.2	Closed-cone coniferous forest and coastal scrub (sometimes with serpentinite soil). 98–820 feet (30–250 meters); Blooms March–May.	Not Likely. Coastal scrub does not occur in the Study Area.
San Francisco gumplant	<i>Grindelia hirsutula</i> var. <i>maritima</i>	none/none/1B.2	Coastal bluff scrub, coastal scrub, and valley and foothill grassland habitats in association with sandy or serpentinite soils. 49–1,312 feet (15–400 meters); blooms June–September	Not Likely. Although there are a number of recorded occurrences of this species within 5 miles of the Study Area, this species was not observed during floristic surveys conducted by CNPS ⁸⁶⁸ and PBS&J in 2007 and 2008.
San Francisco Lessingia	<i>Lessingia germanorum</i>	FE/SE/1B.1	Coastal scrub (remnant dunes). 82–295 feet (25–90 meters); blooms July–November (uncommon in June).	Not Likely. Coastal scrub does not occur in the Study Area. This species was not observed in sandy soil areas during surveys; no species of <i>Lessingia</i> were observed during floristic surveys conducted by CNPS ⁸⁶⁹ and PBS&J in 2007 and 2008.

⁸⁶⁸ Ibid.

⁸⁶⁹ Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
San Francisco owl's-clover	<i>Triphysaria floribunda</i>	none/none/1B.2	Coastal prairie, coastal scrub, and valley and foothill grassland habitats in association with serpentinite soils. 33–525 feet (10–60 meters); blooms April–June	Not Likely. Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of <i>Triphysaria</i> has been observed during floristic surveys conducted by CNPS ⁸⁷⁰ and PBS&J in 2007 and 2008.
San Francisco popcornflower	<i>Plagiobothrys diffusus</i>	None/SE/ 1B.1	Occurs in coastal prairie and valley and foothill grassland. 197–1,181 feet (60–360 meters); blooms March–June.	Not Likely. Known from fewer than ten occurrences. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Plagiobothrys</i> were observed during floristic surveys conducted by CNPS ⁸⁷¹ and PBS&J in 2007 and 2008.
SanMateo thorn-mint	<i>Acanthomintha duttonii</i>	FE/SE/1B.1	Chaparral and valley and foothill grassland habitats, often on serpentinite soil substrates. 164–984 feet (50–300 meters); blooms April–June	Not Likely. Serpentine soil substrates do not occur within Study Area, however there are no recorded occurrences of this species within 5 miles of the Study Area; species of <i>Acanthomintha</i> were not observed during floristic surveys conducted by CNPS ⁸⁷² and PBS&J in 2007 and 2008.
Santa Cruz microseris	<i>Stebbinsoseris decipiens</i>	none/none/1B.2	Openings in broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grasslands, sometimes on serpentine soils. 33–1,640 feet (10–500 meters); blooms April–May.	Not Likely. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of <i>Stebbinsoseris</i> were observed during floristic surveys conducted by CNPS ⁸⁷³ and PBS&J in 2007 and 2008.
Short-leaved evax	<i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	none/none/2.2	Coastal bluff with sandy soil and coastal dunes. 0–705 feet (0–215 meters); blooms March–June.	Not Likely. Suitable habitat for this species does not occur in the Study Area.
White-rayed pentachaeta	<i>Pentachaeta bellidiflora</i>	FE/SE/List 1B.1	Occurs in cismontane woodland and valley and foothill grassland, often in serpentinite. 115–2034 feet (35–620 meters); blooms March–May	Not Likely. Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of <i>Pentachaeta</i> were observed during floristic surveys conducted by CNPS ⁸⁷⁴ and PBS&J in 2007 and 2008.

⁸⁷⁰ Ibid.

⁸⁷¹ Ibid.

⁸⁷² Ibid.

⁸⁷³ Ibid.

⁸⁷⁴ Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
SENSITIVE NATURAL COMMUNITIES				
Coastal brackish marsh (salt marsh)		CDFG Sensitive Habitat		Known. The Study Area supports representative assemblages of plant species associated with this community type. Degraded occurrences of this sensitive natural community are present along the southern portion of HPS Phase II site, along Yosemite Slough, and patches along the Candlestick Point shoreline. ⁸⁷⁵
INVERTEBRATES				
Bay checkerspot butterfly	<i>Euphydryas editha bayensis</i>	FT/none/none Critical habitat	All habitats for the bay checkerspot are on shallow, serpentine-derived, or similar soils. These soils support the plants on which the caterpillars (larvae) feed the primary larval host plant is dwarf plantain (<i>Plantago erecta</i>). In many years, the plantain dries up and the larvae transfer to a second host plant, Indian paintbrush, or purple owl's clover (<i>Castilleja exserta</i> spp. <i>exserta</i>), which remains edible later in the season.	Not Likely. It is not likely that there is a sufficient population of plantain to support Bay checkerspot in the Study Area. ⁸⁷⁶ Sites that support this species provide greater topographic heterogeneity than the serpentine grassland in the Study Area. Although there are a number of recorded occurrences for this species within 5 miles of the Study Area, this species was extirpated from the closest location of historical occurrence (San Bruno Mountain) in the 1980's.
Callippe silverspot butterfly	<i>Speyeria callippe callippe</i>	FE/none/none	Occurs in grassland habitats around the northern Bay Area containing Johnny jump-up (<i>Viola pedunculata</i>), which is the larval host plant for this species.	Not Likely. Although there are a number of recorded occurrences within 5 miles of the Study Area, <i>V. pedunculata</i> has not been observed within the Study Area. In addition, although there are nearby occurrences, there is an insufficient population of this species' host plant within the Study Area to sustain a population of this species. ⁸⁷⁷

⁸⁷⁵ H.T. Harvey & Associates, Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California, February 2009 and revised July 13, 2009 and October 2, 2009.

⁸⁷⁶ Kobernus, P., Senior Biologist, TRA Environmental Sciences, Inc., email to PBS&J, August 30, 2007.

⁸⁷⁷ Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Mission blue butterfly	<i>Plebejus [Icaricia] icarioides missionensis</i>	FE/none/none	The adults feed on hairy false goldenaster (<i>Heterotheca villosa</i>), blue dicks (<i>Dichelostemma capitatum</i>), and seaside buckwheat (<i>Eriogonum latifolium</i>). They do not wander far from the three species of lupine that are the larval food plant: silver lupine (<i>Lupinus albifrons</i>), summer lupine (<i>L. formosus</i>), and many-colored lupine (<i>L. versicolor</i>). Females lay eggs throughout the mating flight. The eggs are laid singly on leaves, stems, flowers, and seedpods of lupine species.	Not Likely. Although there are a number of recorded occurrences for this species within 5 miles of the Study Area, including one from the Bayview Hill area, the Study Area does not support a substantial stand of lupine (<i>Lupinus</i> spp.) to support this species. ⁸⁷⁸ Isolated lupine plants intermixed within ruderal vegetation was observed along the Candlestick Point area, near Yosemite Slough. One or two lupine plants were observed in this area during the May 5, 2008 survey, but this would not constitute habitat for this species.
Monarch butterfly (wintering) ⁸⁷⁹	<i>Danaus plexippus</i>	none/none/ESHA	Occur in many open habitats including fields, meadows, weedy areas, marshes, and roadsides. Adults migrate from August to October, flying south to hibernate along the California coast and in central Mexico. During migration and wintering, butterflies roost in trees and form huge aggregations. Caterpillars feed exclusively on milkweed (<i>Asclepias</i> spp.); early in the season, adults sip nectar from dogbane (<i>Apocynum</i> spp.), lilac (<i>Ceanothus</i> spp.), red clover (<i>Trifolium pratense</i>), <i>Lantana</i> spp., and thistles (<i>Cirsium</i> spp.). In the fall adults visit composites including goldenrods (<i>Solidago californica</i>), blazing stars (<i>Liatris spicata</i>), ironweed (<i>Vernonia</i> spp.), and tickseed sunflower (<i>Bidens</i> spp.).	Known, but Not Likely roosting. Although individuals have been observed on the site, there is no record of monarch butterfly autumnal (i.e., temporary bivouac site) or over-wintering use of the Study Area in the CNDDb and other records, including anecdotal observations. The nearest observations of such roosts are at Fort Mason, the Presidio of San Francisco, and Stern Grove. The modification of Hunters Point and Candlestick Park would not affect those sites. ⁸⁸⁰
Myrtle's silverspot butterfly	<i>Speyeria zerene myrteleae</i>	FE/none/none	Occurs in grassland habitats around the northern Bay Area. The larval host plant is hookspur violet (<i>Viola adunca</i>). Adults feed on nectar from flowers including hairy gumweed, coastal sand verbenia (<i>Abronia latifolia</i>), mints (or monardella) (<i>Monardella</i> spp.), bull thistle (<i>Cirsium vulgare</i>), and seaside fleabane (<i>Erigeron glaucus</i>).	Not Likely. There are no recorded occurrences of this species within 5 miles of the Study Area. The Study Area does not support the suitable host plants for this species.

⁸⁷⁸ United States Fish and Wildlife Service (USFWS), Endangered and Threatened Wildlife and Plants: *Proposed Determination of Critical Habitat for Six Butterflies and Two Plants*, 42 Federal Register 7972, February 8, 1977.

⁸⁷⁹ Wintering habitat is considered an Environmentally Sensitive Habitat Area by the California Coastal Commission.

⁸⁸⁰ Monroe, M., Ranger, Muir Woods National Monument, telephone conversation with Todd Wong, July 16, 2008.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
San Bruno elfin butterfly	<i>Callophrys [Incisalia] mossii bayensis</i>	FE/none/none	Endemic to the coastal mountains near San Francisco Bay. Eggs are laid in small clusters or strings on the upper or lower surface of broadleaf stonecrop (<i>Sedum spathulifolium</i>). The adult food plants have not been fully determined but Montara Mountain colonies are suspected to use Montara manzanita (<i>Arctostaphylos montaraensis</i>) and California huckleberry (<i>Vaccinium ovatum</i>).	Not Likely. There are a number of recorded occurrences for this species within 5 miles of the Study Area. However, the San Bruno elfin is found in the fog-belt of steep north facing slopes that receive little direct sunlight. It lives near prolific growths of the larval food plant, stonecrop, which is a low growing succulent. The Study Area does not support suitable larval and adult host plants. ⁸⁸¹
MOLLUSKS				
Black abalone	<i>Haliotes cracherodii</i>	FC/none/none	Endemic to Santa Barbara Channel Islands.	Absent. The Study Area is outside the range of this species.
White abalone	<i>Haliotes sorenseni</i>	FE/none/none	Rocky marine subtidal (to 200 feet deep) and extreme lower intertidal (below 15 feet deep) habitats. Current population extremely depleted.	Absent. The Study Area is too shallow and modified to provide suitable habitat.
Olympia oyster	<i>Ostreola conchaphila</i>	none/none/CEQA	Native Olympia oysters were historically abundant in San Francisco Bay, and small populations of native oysters have been documented within the Bay. Suitable substrate includes solid surfaces to which the larvae can easily attach.	High. Because the larval forms of oysters are free-floating in the Bay and a large population exists south of the Study Area at Oyster Point Marina, native oysters are likely present on suitable substrate throughout the Study Area.
FISH				
Pacific herring	<i>Clupea pallasii</i>	none/none/CEQA	Pacific herring generally enter the Bay from November through April of each year and spawn in intertidal and sub-tidal habitats.	Known. According to NMFS, known herring spawning areas within the Study Area include several piers and areas of shoreline both north and south of the proposed marina.
Chinook salmon –Spring-run ESU	<i>Oncorhynchus tshawytscha</i>	FT/ST/none	Central Valley streams with stable water supply, clean gravel, and good quality riparian habitat. Spawning occurs only in tributaries to the Sacramento River.	Low. The Study Area is outside the migratory corridor for this species. Adults migrate from the Golden Gate into the Sacramento River.
Chinook salmon –Winter-run ESU	<i>Oncorhynchus tshawytscha</i>	FE/ST/none Critical habitat	Central Valley streams with stable water supply, clean gravel, and good quality riparian habitat. Spawning occurs upstream of the Red Bluff Diversion Dam.	Low. The Study Area is generally outside the migratory corridor for this species. Adults migrate from the Golden Gate into the Sacramento River. Study Area is outside of designated critical habitat.

⁸⁸¹ Kobernus, P., Senior Biologist, TRA Environmental Sciences, Inc., email to PBS&J, August 30, 2007.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Chinook salmon –Fall/Late Fall- run ESUs	<i>Oncorhynchus tshawytscha</i>	SC/SSC/none	The most abundant Chinook in the Central Valley. Fall/Late fall-run fish spawn in streams with stable water supply, clean gravel, and good quality riparian habitat.	Low. The Study Area is generally outside the migratory corridor for this ESU. A population exists in the South Bay that would migrate past the Study Area on the way to and from the ocean. The origin and status of this population is unclear (refer to text).
Coho salmon— Central California ESU	<i>Oncorhynchus kisutch</i>	FE/SE/none	Spawning in accessible coastal streams, generally in areas with complex instream habitat, heavy forest cover, and high quality water. Juveniles rear in these areas for two years before migrating to the ocean.	Absent. This species does not currently exist in the San Francisco Bay. ⁸⁸²
Delta smelt	<i>Hypomesus transpacificus</i>	FT/SE/none	Endemic to the Sacramento-San Joaquin Delta. Adults spawn in freshwater in the upper Delta. The rest of the year, they reside primarily in the interface between salt and freshwater of the Sacramento-San Joaquin Delta at salinities less than 2 parts per million.	Absent. The Study Area is outside the known range of this species.
Longfin Smelt	<i>Spirinchus thaleichthys</i>	none/ST/none	Native to San Francisco Bay. Adults spawn in upper estuary in early winter. Larvae are dispersed by downstream flow and distribution is determined by outflow. Adults found outside the Bay in some years.	Moderate. Based on a 2009 status review, distribution of larval fish is determined by outflow from the Sacramento-San Joaquin River Estuary where adults spawn. ⁸⁸³ As they develop swimming ability, they could disperse into the Study Area. They are captured as by-catch in the Bay for bay shrimp (<i>Crangon franciscorum</i>).
Green sturgeon	<i>Acipenser medirostris</i>	FT/SSC/none Proposed Critical Habitat	Migrates through the San Francisco Bay to spawning grounds in the upper Sacramento River. Juveniles move into the estuary and likely rear in San Francisco Bay.	High. The species likely forages in the Bay including the area near the Study Area. The Study Area is within proposed critical habitat for this species.
Steelhead— Central California Coast DPS	<i>Oncorhynchus mykiss</i>	FT/none/none Critical habitat	Spawns in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating to the ocean.	High. Juveniles and adult steelhead could be found in the open waters adjacent to the Study Area as they migrate to and from streams in the San Francisco Bay. Populations are known from relatively nearby creeks on the peninsula (i.e., San Francisquito Creek). The Study Area is within designated critical habitat for this DPS.

⁸⁸² Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.

⁸⁸³ California Department of Fish and Game (CDFG), *A Status Review of the Longfin Smelt (Spirinchus thaleichthys) in California*, January 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Steelhead— Central Valley DPS	<i>Oncorhynchus mykiss</i>	FT/none/none Critical habitat	Spawns in cool, clear, well-oxygenated streams. Juveniles remain in freshwater for one or more years before migrating to the ocean.	Low. Even though their primary migratory pathway is into the Sacramento River, juveniles and adult steelhead could potentially be found in the Bay near the Project. The Study Area is outside of designated critical habitat for this DPS.
Tidewater goby	<i>Eucyclogobius newberryi</i>	FE/SSC/none	Brackish water habitats along coast, fairly still but not stagnant water and high oxygen levels.	Absent. The shoreline of the Study Area is influenced by tidal activity. Brackish water habitat absent. Due to degradation lagoon/estuary habitat does not exist. ⁸⁸⁴
AMPHIBIANS				
California red- legged frog	<i>Rana aurora draytonii</i>	FT/SSC/none	Permanent and semi-permanent freshwater habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation.	Not Likely. Perennial freshwater habitat is absent from the Study Area. There are no CNDDDB records for this species in the vicinity of the Study Area.
REPTILES				
Green turtle	<i>Chelonia mydas</i>	FT/none/none	Shallow water with sufficient submergent vegetation. Breeds on islands often but also on mainland sandy beaches.	Absent. Suitable habitat for this species does not occur in the Study Area.
Leatherback turtle	<i>Dermochelys coriacea</i>	FE/none/none	Marine, open ocean often near continental shelf. Nests on sloped sandy beaches often near deep water.	Absent. Suitable habitat for this species does not occur in the Study Area.
Loggerhead turtle	<i>Caretta caretta</i>	FT/none/none	Open ocean up to 500 miles off shore. Nests on sandy beaches seaward of well developed dunes.	Absent. Suitable habitat for this species does not occur in the Study Area.
Olive (=Pacific) ridley sea turtle	<i>Lepidochelys olivacea</i>	FT/none/none	Near shore less and 15 km. bottom dwelling sea turtle, nests on sandy beaches.	Absent. Suitable habitat for this species does not occur in the Study Area.
San Francisco garter snake	<i>Thamnophis sirtalis tetrataenia</i>	FE/ST/FP	Inhabits ponds, streams, rivers, and reservoirs, typically with riparian or emergent vegetation. Requires upland areas for aestivation and nesting, usually within 100 yards of permanent water source.	Not Likely. Suitable habitat for this species does not occur in the Study Area. There are no CNDDDB records for this species in the vicinity of the Study Area.
Western pond turtle	<i>Actinemys marmorata</i>	none/SSC/none	Typically inhabit ponds, slow-moving streams and rivers, irrigation ditches, and reservoirs with abundant emergent and/or riparian vegetation.	Not Likely. Suitable habitat for this species does not occur in the Study Area. There are no CNDDDB records for this species in the vicinity of the Study Area.

⁸⁸⁴ Jones and Stokes, *Biological Assessment for the Bayview Transportation Improvements Project*, June 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
BIRDS				
Alameda song sparrow	<i>Melospiza melodia pusillula</i>	none/SSC/none	Tidal salt marsh habitats along the edge of the Bay and streams where tidal flow effects the vegetation.	Low. Salt marsh along Yosemite Slough and the HPS shoreline provides marginal habitat for this species due to its limited extent. Song sparrows were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were Alameda song sparrows.
American peregrine falcon (nesting)	<i>Falco peregrinus anatum</i>	Delisted/SE (proposed delisted)/FP	Frequents bodies of water in open areas with cliffs and canyons nearby for cover and nesting. Known to nest on artificial substrates (bridges, buildings, etc)	Known. A pair of American Peregrine falcons was observed nesting in the Re-gunning crane on Parcel D of the HPS Phase II site. The pair has raised several young at this location. ⁸⁸⁵
Bank swallow (nesting)	<i>Riparia riparia</i>	none/ST/none	Nests in steep sandy banks where it excavates burrows.	Not Likely. Although individuals have been observed in the vicinity, the Study Area does not provide suitable nesting habitat.
Barrow's goldeneye	<i>Bucephala islandica</i>	none/SSC/none	Breeds in high central & northern Sierra Nevada Mountains, near wooded mountain lakes or large streams. Nest in tree cavities, such as a deserted nest-hole of a pileated woodpecker or flicker; also use nest boxes.	Known. Although observed near the site during migration and winter, the Study Area does not provide suitable nesting habitat and is well outside the species' breeding range.
Bryant's savannah sparrow	<i>Passerculus sandwichensis alaudinus</i>	none/SSC/none	Frequents low tidally influenced habitats, adjacent to ruderal areas, moist grasslands within and just above the fog belt, and grasslands.	Low. Salt marsh along Yosemite Slough and the HPS shoreline provides marginal habitat for this species due to its limited extent. Savannah sparrows were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were Bryant's savannah sparrows.
Burrowing owl	<i>Athene cunicularia</i>	none/SSC/none	Found in open, dry grasslands, deserts, and ruderal areas. Requires suitable small mammal burrows.	Known. This species has been observed in the past on Candlestick Point and at HPS, and suitable foraging habitat is present on the site. Although suitable conditions for nesting are present, the species is not known to have nested on the site. Currently, it is either absent, or it occurs sporadically as a non-breeding visitor.
California black rail	<i>Laterallus jamaicensis coturniculus</i>	none/ST/FP	Inhabits tidal salt marshes bordering larger bays, or other freshwater and brackish marshes, at low elevations.	Not Likely. Small mats of pickleweed adjacent to brackish wetlands are too limited in extent and too highly disturbed to provide suitable habitat. Tidal zone is very narrow.

⁸⁸⁵ Nelson, G., Facility Coordinator, Navy, field visit with PBS&J, July 8, 2008.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
California brown pelican (rookery and communal roosts)	<i>Pelecanus occidentalis californicus</i>	FPD/SPD ⁸⁸⁶ /FP	Typically in littoral ocean zones, just outside the surf line; nests on offshore islands.	Known. This species was observed roosting on piers within the Study Area. However, suitable nesting habitat for this species does not occur in the Study Area. The Study Area is outside this species' current breeding range.
California clapper rail	<i>Rallus longirostris obsoletus</i>	FE/SE/FP	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickle-weed; feeds on mollusks removed from the mud in sloughs.	Not Likely. Suitable habitat does not occur in the Study Area. Salt marsh is highly disturbed and limited in the Study Area. Yosemite Slough is a tidal slough, but suitable habitat for the rail is absent because the existing salt marsh in Yosemite Slough is very narrow and unsuitable. The lack of tidal channels within those marshes, feeding into Yosemite Slough further reduce habitat quality.
California least tern (nesting colony)	<i>Sternula antillarum browni</i>	FE/ST/FP	Nests on sandy, upper ocean beaches, and occasionally uses mud flats; forages on adjacent surf line, estuaries, or the open ocean.	Not Likely. Suitable nesting habitat does not occur in the Study Area. Individuals may forage in the open water adjacent to the Study Area.
Common loon	<i>Gavia immer</i>	none/SSC/none	Nesting locations at certain large lakes & reservoirs in interior of state, primarily in northeastern plateau region. Bodies of water regularly frequented are extensive, fairly deep, and produce quantities of large fish.	Known. Although observed near the site during migration and winter, the Study Area does not provide suitable nesting habitat and is well outside the species' breeding range.
Harlequin duck (nesting)	<i>Histrionicus histrionicus</i>	none/SSC/none	Usually nests along shores of shallow, swift rivers with plentiful aquatic invertebrates. ⁸⁸⁷	Known. This species was observed perching on the piers in the HPS Phase II site. However, the Study Area does not provide suitable nesting habitat for this species. The Study Area is outside this species' current breeding range.
Loggerhead shrike	<i>Lanius ludovicianus</i>	none/SSC/none	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. Typically nests in broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and wash.	Known. Non-native grasslands provide suitable foraging habitat. Loggerhead shrike has been observed by Alan Hopkins at the CPSRA. ⁸⁸⁸ Although suitable conditions for nesting are present, the species is not known to have nested on the site. Currently, it is either absent, or it occurs sporadically as a non-breeding visitor.

⁸⁸⁶ California Department of Fish and Game (CDFG) news release: *Fish and Game Commission votes to remove California brown pelican from State Endangered Species List*. February 17, 2009.

⁸⁸⁷ California Department of Fish and Game (CDFG). Website: <http://www.dfg.ca.gov/whdab/html/B096.html>. Accessed April 6, 2005.

⁸⁸⁸ Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Marbled murrelet	<i>Brachyramphus marmoratus</i>	FT/SE/none	Mature, coastal coniferous forests for nesting; nearby coastal water for foraging; nests in conifer stands greater than 150 years old and may be found up to 35 miles inland; winters on subtidal and pelagic waters often well offshore.	Absent. Suitable habitat not present in the Study Area.
Northern harrier	<i>Circus cyaneus</i>	none/SSC/none	Coastal salt & fresh-water marsh. Nest & forage in grasslands, from salt grass in desert sink to mountain cienegas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Known. Salt marsh and ruderal habitats provide suitable foraging habitat for this species, which has been observed by Alan Hopkins at the CPSRA. ⁸⁸⁹ However, suitable breeding habitat is absent due to the limited extent of marsh, human disturbance, and vulnerability of this ground-nesting species to predation.
San Francisco yellowthroat	<i>Geothlypis trichas sinuosa</i>	none/SSC/none	Inhabits emergent wetland habitat, and is a resident and summer visitor in the San Francisco Bay area. Nests are usually placed on or within 8 cm (3 inches) of ground; and may be positioned over water in emergent aquatic vegetation, dense shrubs, or other dense growth.	Moderate. Salt marsh along Yosemite Slough and the HPS shoreline provides potential habitat for this species. The existing salt marsh provides marginal habitat due to its limited extent. Common yellowthroats were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were San Francisco yellowthroats. ⁸⁹⁰
Short-eared owl	<i>Asio flammeus</i>	none/SSC/none	Found in swamplands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Known. Salt marsh and ruderal habitats provide suitable foraging habitat for this species, which has been observed by Alan Hopkins at the CPSRA. ⁸⁹¹ However, suitable breeding habitat is absent due to the limited extent of marsh, human disturbance, and vulnerability of this ground-nesting species to predation.
Short-tailed albatross	<i>Phoebastria albatrus</i>	FE/none/none	Pelagic; nests on offshore islands in north Pacific.	Absent. Suitable habitat does not occur in the Study Area.
Tricolored Blackbird	<i>Agelaius tricolor</i>	none/SSC/none	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	Known. Ruderal and developed areas on the site provide potential foraging habitat for this species, and the tricolored blackbird has been observed by Alan Hopkins at the CPSRA. ⁸⁹² However, suitable nesting habitat is absent due to the lack of extensive freshwater marsh vegetation.

⁸⁸⁹ Ibid.

⁸⁹⁰ Ibid.

⁸⁹¹ Ibid.

⁸⁹² Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Vaux's swift	<i>Chaetura vauxi</i>	none/SSC/none	Redwood, Douglas fir, & other coniferous forests. Nests in large hollow trees & snags. Often nests in flocks. Forages over most terrains & habitats.	Known. Suitable nesting habitat does not occur in the Study Area. However, individuals may forage aerially over the Study Area.
Western snowy plover (nesting)	<i>Charadrius alexandrinus nivosus</i>	FT/SSC/none	Coastal beaches above the normal high tide line in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent.	Not Likely. Extensive, open sandy substrate to provide nesting habitat within the Study Area is absent.
White-tailed kite	<i>Elanus leucurus</i>	none/none/FP	Preferred habitat is marshes and waste fields in the Central Valley and coastal plains of California.	Known. Non-native grasslands provide suitable foraging habitat. Large trees in the Study Area provide suitable nesting habitat for this species, although the species is not known to nest there.

MAMMALS

Blue whale	<i>Balaenoptera musculus</i>	FE/none/none	Coastal and pelagic environments frequently found on the continental shelf off the California coast.	Absent. Suitable habitat does not occur in the Study Area.
Finback whale	<i>Balaenoptera physalus</i>	FE/none/none	Pelagic; usually found 25 miles or more off shore.	Absent. Suitable habitat does not occur in the Study Area.
Guadalupe fur seal	<i>Arctocephalus townsendii</i>	FT/ST/FP	Rocky insular shorelines and sheltered coves.	Absent. Suitable habitat does not occur in the Study Area.
Right whale	<i>Eubalaena glacialis</i>	FE/none/none	Pelagic, occurs mainly over continental shelf in the Pacific Ocean.	Absent. Suitable habitat does not occur in the Study Area.
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE/SE/FP	Salt marshes with a dense plant cover or pickleweed or fat hen; adjacent to an upland site.	Not Likely. Small mats of pickleweed adjacent to brackish wetlands and salt marsh habitat in the Study Area are highly disturbed. This species has not been recorded on the Peninsula north of the Foster City/ San Mateo Bridge area in decades.
Sei whale	<i>Balaenoptera borealis</i>	FE/none/none	Pelagic; generally in deep water along continental shelf.	Absent. Suitable habitat does not occur in the Study Area.
Sperm whale	<i>Physeter catodon</i>	FE/none/none	Pelagic; prefers deep water but is sometimes found around islands or in shallow shelf waters.	Absent. Suitable habitat does not occur in the Study Area.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status ^a Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
Stellar sea-lion	<i>Eumetopias jubatus</i>	FT/none/none Critical habitat	Near shore, pelagic when in water. Otherwise on shore, talus or bare rocks. Critical habitat has been defined for stellar sea lion as a 20 nautical mile buffer around all major haulouts and rookeries, as well as associated terrestrial, air and aquatic zones, and three large offshore foraging areas. ⁸⁹³	Not Likely. Suitable habitat does not occur in the Study Area. Designated critical habitat does not occur in the Study Area. The closest designated critical habitat for this species is the Farallon Islands, approximately 33 air miles east of the Study Area.
Western red bat	<i>Lasiurus blossevillei</i>	none/SSC/none	Roosts primarily in trees, less often in shrubs, adjacent to streams, fields, or urban areas. Preferred roost sites are protected from above, open below, and located above dark ground cover.	Moderate. Trees (such as eucalyptus) provide potential roost sites for solitary migrant individuals.

SOURCE: CDFG Natural Diversity Database (CNDDB), July 2009 for the US Geological Survey's (USGS) 7.5-minute San Francisco South and Hunters Point quadrangles.
California Native Plant Society (CNPS), July 2009 for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles.
US Fish and Wildlife Service (USFWS), July 2009 for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles

a. Status:

Federal

- FE Federally listed as Endangered
- FT Federally listed as Threatened
- FC Federal candidate species
- FPD Federally Proposed Delisted
- SC National Marine Fisheries Service designated Species of Concern. Species of Concern status does not carry any procedural or substantive protections under the FESA.

State

- SE State listed as Endangered
- ST State listed as Threatened
- SPD State Proposed for Delisting
- SR State Rare
- FP California Department of Fish and Game designated "Fully Protected"
- SSC California Department of Fish and Game designated "Species of Special Concern"

Other

- ESHA Environmentally Sensitive Habitat Area by the California Coastal Commission
- SLC California Native Plant Society (CNPS) Ranking Species of Local Concern
- 1B California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California and elsewhere.
- 2 California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California, but more common elsewhere.
- 3 California Native Plant Society (CNPS) Ranking. Plants About Which More Information is Needed—A Review List.
- CEQA Species not currently protected by statute or regulation, but considered rare, threatened or endangered under Section 15380 of the CEQA Guidelines.
- Recent modifications to the CNPS Ranking System include the addition of a new Threat Code extension to listed species (i.e., List 1B.1, List 2.2 etc.). A Threat Code extension of .1 signifies that a species is seriously endangered in California; .2 is fairly endangered in California; and .3 is not very endangered in California.

b. Likelihood of occurrence evaluations

- A rating of "**Known**" indicates that the species/natural community type has been observed on the site.
- A rating of "**High**" indicates that the species has not been observed, but sufficient information is available to indicate suitable habitat and conditions are present in the Study Area and the species is expected to occur in the Study Area.

⁸⁹³ National Marine Fisheries Service (NMFS), *Designated Critical Habitat; Stellar Sea Lion*, 58 Federal Register 45269, 1993.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

<i>Common Name</i>	<i>Scientific Name</i>	<i>Status^a Fed/ CA/ other</i>	<i>Habitat and Seasonal Distribution in California</i>	<i>Likelihood of Occurrence Within the Study Area</i>
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- A rating of "**Moderate**" indicates that it is not known if the species is present, but suitable habitat exists in the Study Area.
- A rating of "**Low**" indicates that species was not found during biological surveys conducted to date on the Project site and may not be expected given the species' known regional distribution or the quality of habitats located in the Study Area.
- A rating of "**Not Likely**" indicates that the taxon would not be expected to occur in the Study Area because the Study Area does not include the known range or does not support suitable habitat.
- A rating of "**Absent**" indicates that no recorded occurrences or suitable habitat(s) occur within the Study Area to support this species. These species are not discussed further in this document.

