I-80/Gilman Street Interchange Improvement Project

Biological Assessment

Gilman Street Outfall

Caltrans District 4

Interstate 80

Alameda County
04-ALA-80-PM 6.38/6.95
EA 04-0A7700 / EFIS# 0400020155

February 2019

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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Summary

The California Department of Transportation (Caltrans) District 4, in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes the Interstate 80 (I-80)/Gilman Street Interchange Improvement Project (project) to improve traffic, pedestrian, and bicycle operations. The purpose of the project is to simplify and improve navigation, mobility, and traffic operations; reduce congestion, vehicle queues, and conflicts; improve local and regional bicycle connections and pedestrian facilities; and improve safety at the I-80/Gilman Street interchange. A small portion of this project involves work in the San Francisco Bay (Bay) to install a tidal flap gate on the Gilman Street outfall and recontour the shoreline around the outfall. This portion of the project may affect listed species under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA) Fisheries and is the subject of this Biological Assessment (BA). The project is located within the Richmond United States Geological Survey (USGS) 7.5-minute topographic quadrangle.

The federal Action Area (AA) is the area that the proposed project's activities may directly, indirectly, temporarily, or permanently impact by construction and construction-related activities. For this project, the AA encompasses the limits of construction activity (i.e., project footprint) and surrounding areas potentially inhabited by regional special-status species that could be affected by the project, where appropriate. The tidal flap gate work area portion of the AA is the focus of this BA, and will be referred to as the AA for the purpose of this analysis. The AA consists of the footprint of the tidal flap gate work area and an approximate 200-foot buffer around the work area to account for construction-related disturbances that may affect species regulated by NOAA Fisheries. The 5-acre AA consists of urban development and estuarine habitat.

The proposed action consists of installation of a tidal flap gate at the existing headwall of the 60-inch reinforced concrete pipe (RCP) at the western terminus of Gilman Street to prevent tidal backflow from entering the outfall pipe. The 60-inch RCP at the western terminus of Gilman Street is the outfall for the Gilman Street watershed. The Gilman Street watershed consists of underground drainage culverts, which do not provide suitable habitat for fish. Furthermore, Oakland Museum of California watershed maps indicate that the 60-inch RCP and associated tributary drainage systems do not represent a creek or creeks that were historically placed into underground drainage pipes (OMCA, 2018). Therefore, the Gilman Street watershed has never provided suitable aquatic habitat for fish. Although fish or other aquatic species may incidentally enter these underground pipes in the existing condition, the pipes do not provide connectivity to any upstream aquatic habitat either currently or historically. On this basis, installation of a tidal flap gate on the outfall of the Gilman Street watershed is not considered a barrier to fish passage.

Vegetation Types

Land cover types identified within the AA include estuarine and urban. The urban land cover type within the AA only contains pavement and ruderal vegetation that does not provide habitat for federally listed species.

Wetlands and Other Waters of the U.S.

Construction of the tidal flap gate would require work within the Bay. Approximately 2.04 acres of Clean Water Act Section 404 regulated waters occur in the AA.

Federally Listed Species and Habitats

Based on database searches, NOAA Fisheries species list, NOAA Essential Fish Habitat (EFH), and critical habitat shapefiles, it was determined that the AA is EFH for species managed under the Pacific Coast Salmon Fishery Management Plan (FMP) (Coho and Chinook salmon) and species managed under the Coastal Pelagic Species FMP and Pacific Coast Groundfish FMP. These data were also used to determine that the AA is within critical habitat for the following listed species under the jurisdiction of NOAA Fisheries:

- Green sturgeon *(Acipenser medirostris)* – Southern Distinct Population Segment (DPS)
- Steelhead *(Oncorhynchus mykiss irideus)* – Central Valley DPS
- Steelhead – Central California coast DPS
- Chinook salmon *(Oncorhynchus tshawytscha)* – Sacramento River winter-run Evolutionary Significant Unit (ESU)

Critical habitat for Central Valley spring-run Chinook salmon is not present in the action area and thus is not analyzed in this BA.

Based on the NOAA Fisheries species list, 18 federally listed wildlife species under the jurisdiction of NOAA Fisheries are considered to have potential to occur within the 6 quadrangles surrounding the AA. Species lists for each quadrangle are presented in Appendix A. A wildlife habitat assessment and literature review were conducted within the AA. After further review, 15 of these species were determined to have no potential to occur in the AA based on known occurrences, lack of suitable habitat, and the timing and route of migration corridors. Three federally listed wildlife species were determined to have low potential to occur in the AA; these species include:

- Green sturgeon – Southern DPS, Federally Threatened
- Steelhead – Central Valley DPS, Federally Threatened
- Steelhead – Central California coast DPS, Federally Threatened
- Chinook salmon – Central Valley spring-run ESU, Federally Threatened
- Chinook salmon – Sacramento River winter-run ESU, Federally Endangered

Green sturgeon, in low density, is the only species that has the potential to be present within the Bay year-round. Chinook and steelhead are only present in the Bay during migratory periods, either when adults migrate from the ocean to upstream freshwater breeding habitat or when juveniles out-migrate from natal streams to the ocean. The AA occurs in a small amount (2.04 acres) of suitable habitat (i.e., Bay waters) for these species, and this suitable habitat is absent from the AA two times per day at low tide. As such, there is a low probability of occurrence of these three species within the AA.

The proposed action is anticipated to result in minimal effects on listed species, critical habitat, and EFH under the jurisdiction of NOAA Fisheries. Potential effects would be limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new rock slope protection (RSP); water quality impacts from cofferdam operation and sediment removal at the shoreline; and potential entrapment of fish in the work area during cofferdam installation. Installation and operation of a sheet pile cofferdam would result in a temporary loss of 0.03 acre of habitat. Permanent effects would be limited to the loss of 0.01 acre of habitat from construction of the new headwall and wingwalls of the Gilman Street outfall and placement of new RSP. Removal of sediment to recontour the beach would result in the cut of 0.21 acre of sediment; this cut would result in no net loss of critical habitat and is not considered permanent loss. Project Features and Avoidance and Minimization Measures (AMMs) are proposed as a means to limit, to the greatest extent practicable, the potential for the project to result in direct take of federally listed species.

Project Effects

Caltrans requests a Letter of Concurrence (LOC) that project activities:

- *May affect, but will not likely adversely affect* green sturgeon, Central Valley steelhead, central California coast steelhead, Central Valley spring-run Chinook salmon, and Sacramento River winter-run Chinook salmon
- *May adversely affect* EFH
- *May affect, but is not likely to adversely modify* critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon

As a result of these project activities, Caltrans concludes that the proposed project would not jeopardize the continued existence of these species.

Compensatory Mitigation

Effects of the proposed action are primarily temporary in nature, associated with installation and operation of a cofferdam in the Bay and potential water quality degradation associated with operations within the cofferdam and sediment grading at the shoreline. The proposed

action may result in minimal permanent effects to federally regulated species critical habitat and would not diminish the potential of the portion of the Bay in the AA as a movement corridor. In addition, all disturbed in-water and upland work areas would be restored upon completion of construction. Caltrans does not, therefore, propose any compensatory mitigation as part of this project.

Cumulative Effects

There are 15 reasonably foreseeable future and present projects projects within a 1-mile radius of the AA. Considering these projects, as well as the proposed Project Features and AMMs, Caltrans has determined the project may result in a negligible contribution to adverse cumulative impacts on protected habitats or special-status species. Species with potential to be temporarily impacted by project construction activities in the Bay, special-status fish, and managed fisheries would seek suitable habitat elsewhere in the Bay and adjacent habitats to the north, west, and south of the project site. Disturbed habitat areas would be restored to preconstruction conditions following completion of construction activities to the greatest extent practicable.

Contents

Figures

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List of Abbreviations

Abbreviation	Term
°F	degrees Fahrenheit
AA	Action Area
Alameda CTC	Alameda County Transportation Commission
AMM	Avoidance and Minimization Measure
APIP	Aquatic Park Improvement Program
BA	Biological Assessment
Bay	San Francisco Bay
Bay Trail	San Francisco Bay Trail
BMP	Best Management Practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	*Code of Federal Regulations*
CLN	California Lands Network
CNDDB	California Natural Diversity Database
CY	cubic yards
DPS	Distinct Population Segment
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ESA	Environmentally Sensitive Area
ESU	Evolutionary Significant Unit
FHWA	Federal Highway Administration
FMP	Fishery Management Plan
FR	*Federal Register*
HTL	high tide line
I-80	Interstate 80
LOC	Letter of Concurrence
mph	miles per hour
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PBF	physical or biological features
PCBs	polychlorinated biphenyls
PCE	primary constituent element
PFMC	Pacific Fishery Management Council

PG&E	Pacific Gas & Electric
PM	Post Mile
Project	Interstate 80/Gilman Street Interchange Improvement Project
RCP	reinforced concrete pipe
RSP	rock slope protection
SFOBB	San Francisco-Oakland Bay Bridge
SFOBB Project	San Francisco-Oakland Bay Bridge East Span Seismic Safety Project
SLR	sea level rise
UPRR	Union Pacific Railroad
U.S.	United States
USACE	United Stated Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Chapter 1. Introduction

The California Department of Transportation (Caltrans) District 4, in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes the Interstate 80 (I-80)/Gilman Street Interchange Improvement Project (project) to improve traffic, pedestrian, and bicycle operations. A small portion of this project involves work in the San Francisco Bay (Bay) to install a tidal flap gate on the Gilman Street outfall and recontour the shoreline around the outfall. This portion of the project may affect listed species under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA) Fisheries and is the subject of this Biological Assessment (BA). The purpose of this BA is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the project may affect threatened, endangered, or proposed species, critical habitat, and Essential Fish Habitat (EFH) within the jurisdiction of the NOAA Fisheries. Caltrans is requesting a letter of concurrence from NOAA Fisheries regarding these effects. Caltrans, as assigned by the Federal Highway Administration (FHWA), has prepared this BA under its assumption of responsibility at 23 United States Code (U.S.C.) 327(a)(2)(A). The BA is also prepared in accordance with 50 *Code of Federal Regulations* (CFR) 402, legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with FHWA and Caltrans regulations, policies, and guidance. The document presents technical information upon which later decisions regarding project effects are developed.

The Gilman Street interchange is located on I-80 between Post Miles (PM) 6.38 and 6.95 in the cities of Berkeley and Albany, Alameda County. Figure 1-1 displays a map of the project vicinity, and Figure 1-2 is a map of the project location with a polygon demarcating the project footprint. Within the limits of the proposed project, I-80 is a conventional 10-lane freeway with 12-foot-wide lanes and 11-foot-wide shoulders. Gilman Street is a four-lane major arterial with 11-foot-wide lanes and 6-foot-wide shoulders that passes underneath I-80. The I-80/ Gilman Street interchange is a four-lane arterial roadway (Gilman Street) with two lanes in the east-west direction that are intersected with four I-80 on- and off-ramps (West Frontage Road and Eastshore Highway). The Gilman Street outfall is located at the western terminus of Gilman Street, along the western edge of the project footprint in the rock slope protection (RSP) that borders the Bay.

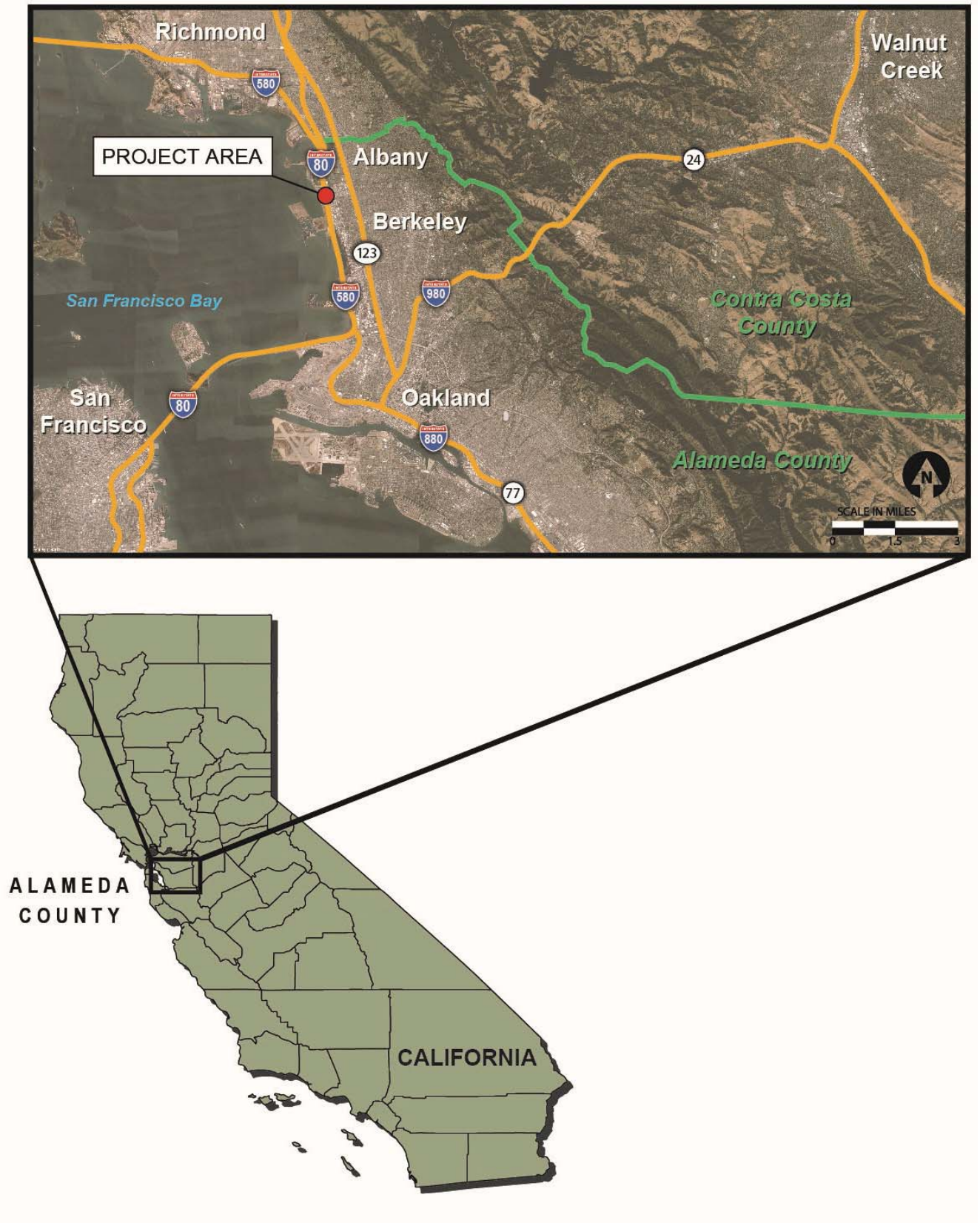

Figure 1-1. Project Vicinity Map

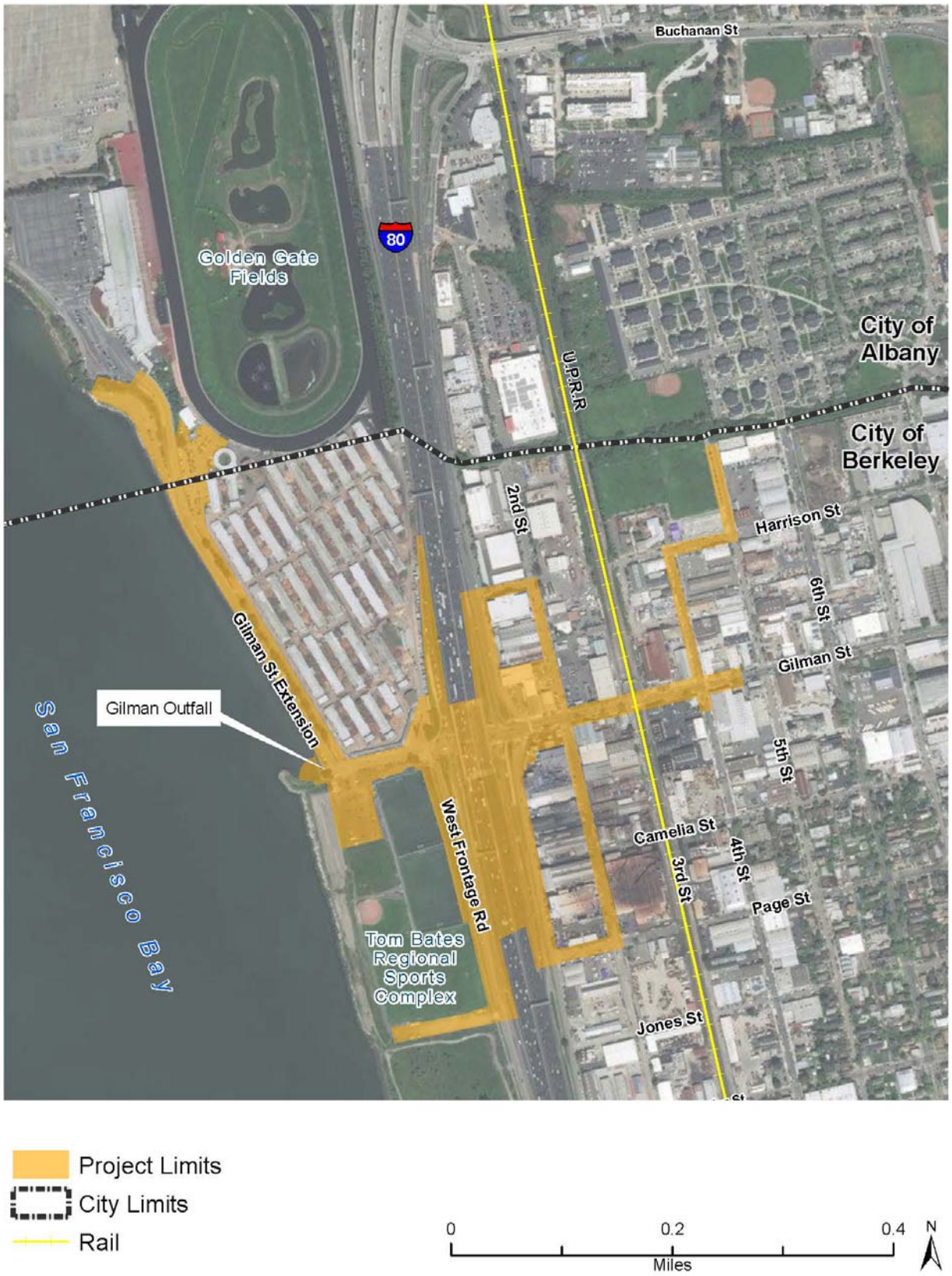

Figure 1-2. Project Location Map

The federal Action Area (AA) is the area that the proposed project's activities may directly, indirectly, temporarily, or permanently be impacted by construction and construction-related activities. For this project, the AA was established to encompass the limits of construction activity (i.e., project footprint) and surrounding areas potentially inhabited by regional special-status species that could be affected by the project, where appropriate. The tidal flap gate work area portion of the AA is the focus of this BA and is referred to as the AA for the purpose of this analysis. The AA consists of the footprint of the tidal flap gate work area and an approximate 200-foot buffer around the work area to account for construction-related disturbances that may affect species regulated by NOAA Fisheries (Figure 1-3). The 5.00-acre AA consists of 2.96 acres of urban development and 2.04 acres of estuarine habitat.

The proposed action consists of installation of a tidal flap gate at the existing headwall of the 60-inch reinforced concrete pipe (RCP). Replacement of the existing headwall and associated riprap with a new headwall for the tidal flap gate would require work within the Bay. The initial phase of this work, involving replacement of the headwall with a new headwall, would be isolated from Bay waters through installation of a cofferdam. Following removal of the cofferdam, sediment at the shoreline around the outfall would be excavated and recontoured. Figures 1-3 through 1-5 display maps and plans of the tidal flap gate and cofferdam.

The tidal flap gate is proposed at the Gilman Street outfall to prevent tidal backflow from entering the outfall pipe. The stormwater outfall pipe runs under Gilman Street and does not provide any upstream habitat for species under the jurisdiction of NOAA Fisheries. Additionally, installation of the tidal flap gate on the Gilman Street outfall would not impede fish passage because there are no existing surface waterbodies within the Gilman Street watershed that provide suitable habitat for salmonids or sturgeon.

Three federally listed species under the jurisdiction of NOAA Fisheries were determined to potentially occur in the AA:

- Green sturgeon *(Acipenser medirostris)* – Southern Distinct Population Segment (DPS), Federally Threatened
- Steelhead *(Oncorhynchus mykiss irideus)* – Central Valley DPS, Federally Threatened
- Steelhead – Central California coast DPS, Federally Threatened
- Chinook salmon *(Oncorhynchus tshawytscha)* – Central Valley spring-run Evolutionary Significant Unit (ESU), Federally Threatened
- Chinook salmon – Sacramento River winter-run ESU, Federally Endangered

Figure 1-3. Project Biological Assessment Action Area Map

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Figure 1-4. Project Layout

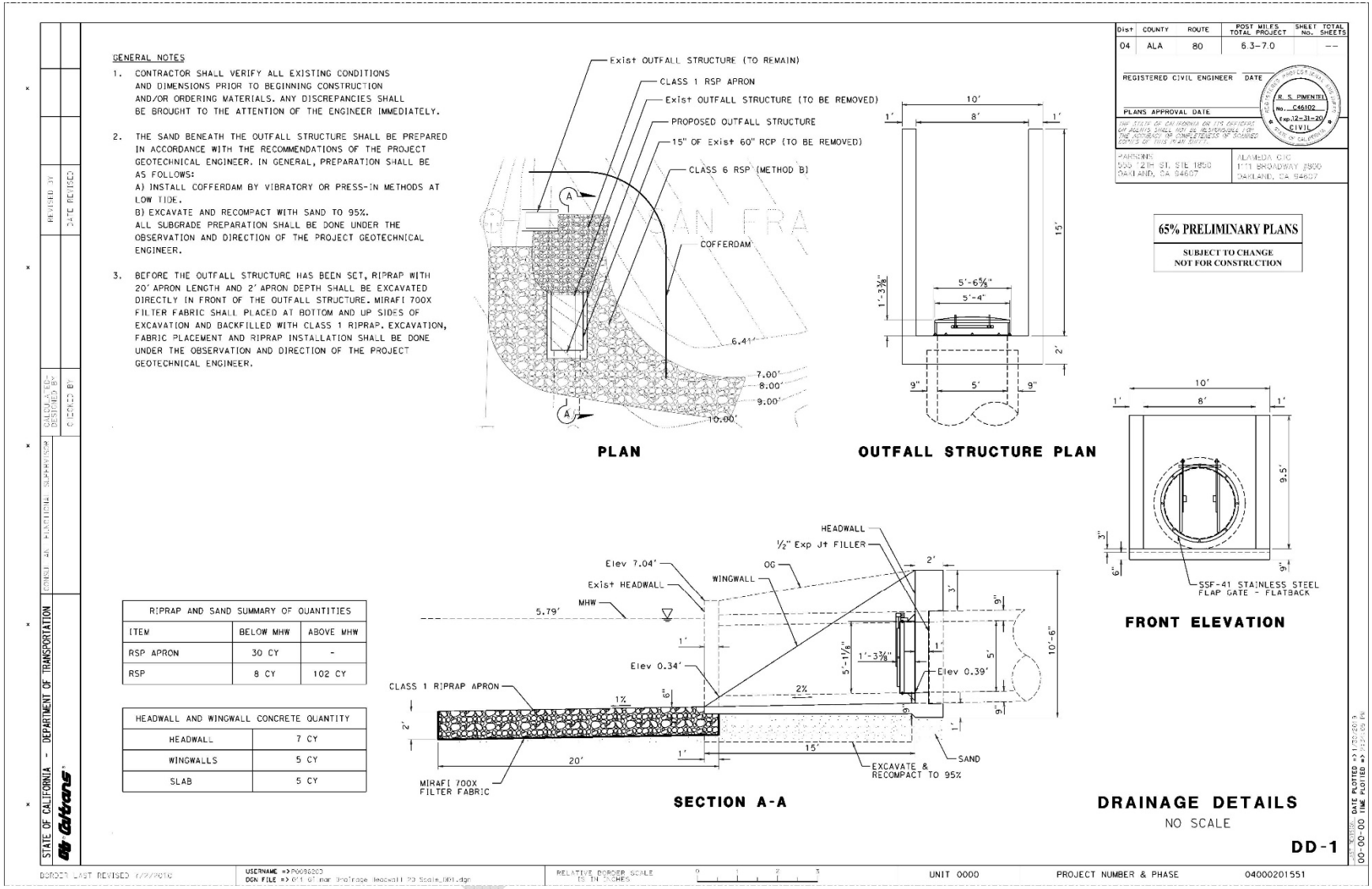

Figure 1-5. Outfall and Tidal Flap Gate Details

The AA also contains EFH for species managed under the Pacific Coast Salmon Fishery Management Plan (FMP) (Coho and Chinook salmon) and species managed under the Coastal Pelagic Species FMP and Pacific Coast Groundfish FMP. Finally, the AA occurs within designated critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon.

Based on the technical information presented in this BA for the proposed action, Caltrans requests a Letter of Concurrence (LOC) from NOAA Fisheries that project activities:

- *May affect, but will not likely adversely affect* green sturgeon, Central Valley steelhead, central California coast steelhead, Central Valley spring-run salmon, and Sacramento River winter-run Chinook salmon
- *May adversely affect* EFH
- *May affect, but is not likely to adversely modify* critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon

1.1 Purpose and Need of the Proposed Action

The purpose of work associated with the proposed project is to:

- Simplify and improve navigation, mobility, and traffic operations on Gilman Street between West Frontage Road and 2nd Street through the I-80 interchange;
- Reduce congestion, vehicle queues, and conflicts;
- Improve local and regional bicycle and pedestrian facilities through the I-80/Gilman Street interchange; and
- Improve safety at the I-80/Gilman Street interchange.

A goal of the proposed project is to improve and enhance the Gilman Street entry corridor into West Berkeley.

In addition, other needs related to modal interrelationships and social considerations have been identified, including completing a link in the local (Gilman Street) and regional (San Francisco Bay Trail [Bay Trail]) bikeway system in the area, and providing safe pedestrian access to and from the project study area.

The purpose for installation of the tidal flap gate within the AA is to prevent tidal backflow from entering the outfall pipe. The water level of the Bay has the potential to increase in elevation as a result of future sea level rise (SLR); however, the Project would not affect additional SLR. SLR by the year 2040 has the potential to impact local low points at the Project site. High-tide stages and storm surges in conjunction with SLR would cause backflow into the 60-inch RCP storm drain outlet near the bay jetty and into the storm drain system draining

Gilman Street and the surrounding area. Therefore, to prevent the effects of backflow due to SLR, a tidal flap gate is proposed to be installed at the existing headwall of the 60-inch RCP at the west end terminus of Gilman Street. The flap gate would reduce backwater caused by high tides by preventing backflow from the Bay into the storm drain system. Tides that are high enough to cause flooding will increase in frequency with SLR. The flap gate would not reduce flooding that is caused by stormwater runoff unable to drain to the Bay due to a high tide. Therefore, the flap gate would reduce backwater due to tidal action but would not reduce flooding due to precipitation.

1.2 Project Description

Work proposed within the AA (i.e., replacement of the tidal flap gate and headwall) is required as a part of a larger project to improve and enhance the Gilman Street entry corridor into West Berkeley. While the project description below describes the project in full, only a subset of work would occur within the AA, which contains approximately 2.04 acres of Bay waters. Work proposed within the AA is outlined in Section 1.2.5.

The project is located in Alameda County at the I-80/Gilman Street interchange in the cities of Berkeley and Albany (PM 6.38 to 6.95). Within the limits of the proposed project, I-80 is a conventional 10-lane freeway with 12-foot-wide lanes and 11-foot-wide shoulders. Gilman Street is a four-lane major arterial with 11-foot-wide lanes and 6-foot-wide shoulders that passes underneath I-80. The I-80/Gilman Street interchange is a four-lane arterial roadway (Gilman Street), with two lanes in the east/west direction that are intersected with four I-80 on- and off-ramps.. Current conditions, along with an overall increase in vehicle traffic, have created poor, confusing, and unsafe operations in the interchange area for vehicles, pedestrians, and bicyclists.

The project includes reconfiguration of the I-80 ramps and intersections at Gilman Street. The existing nonsignalized intersection configuration with stop-controlled ramp termini would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form roundabout intersections on each side of I-80. Gilman Street would be reconstructed on the west from the parking lots at Tom Bates Regional Sports Complex along the western portion of Gilman Street to the eastern side of the 4th Street intersection. Work would also include reconstruction of West Frontage Road and Eastshore Highway within the project limits. In addition, the northern and southern legs of the eastern roundabout would be reduced from two lanes to one lane entering the roundabout. The southbound and northbound movements onto Eastshore Highway would instead be made via 2nd Street to Page Street or 2nd Street to Harrison Street (Figure 1-4).

Improvements associated with installation of the roundabouts would extend approximately 280 feet south on West Frontage Road from the Gilman Street interchange and approximately 250

feet north and 1,010 feet south on Eastshore Highway from the Gilman Street interchange. Work associated with reconfiguration of the eastbound I-80 off-ramp and on-ramp would extend approximately 820 feet south and 280 feet north of the interchange. Work associated with reconfiguration of the westbound I-80 off-ramp and on-ramp would extend approximately 370 feet north and 230 feet south of the interchange. There are no proposed improvements to the freeway mainline. A metering light would be installed on West Frontage Road to regulate the volume of northbound traffic that enters the western roundabout.

The western roundabout intersection would consist of four approach legs: eastbound and westbound Gilman Street, West Frontage Road, and I-80 westbound off-ramp. There would be four exiting legs on the western roundabout: westbound Gilman Street, southbound West Frontage Road, westbound I-80 Gilman on-ramp, and eastbound Gilman Street. The eastern roundabout intersection would include five approach legs: I-80 eastbound off-ramp, northbound and southbound Eastshore Highway, and eastbound and westbound Gilman Street. There would be three exiting legs on the eastern roundabout: I-80 eastbound on-ramp, and westbound and eastbound exits on Gilman Street. A left-turn pocket would be provided on Gilman Street for vehicles traveling eastbound turning onto northbound 2nd Street. Left turns would be restricted from westbound Gilman Street turning onto southbound 2nd Street.

Improvements on 2nd Street north of Gilman Street would include reduced crossing distances, new striping, signing, new pavement, additional landscaping, and new light poles. South of Gilman Street, improvements on 2nd Street would include a bulb-out on the southeast corner of the intersection and converting the road to a single southbound lane, while the other lane would be used as a designated parking/loading zone for businesses.

All modified roadways, including ramps, frontage roads, and arterials, would be improved. Improvements would include mill and overlay of pavement, striping, relocation of drainage inlets, lighting, and signage.

Several operational improvements would be incorporated into the project. A metering signal would be installed on the northbound leg of the western roundabout to limit the volume of traffic that is bypassing the freeway using West Frontage Road. A queue cutting signal would be placed on the eastbound leg of the Union Pacific Railroad (UPRR) crossing at 3rd Street to prevent traffic from extending across the UPRR tracks.

1.2.1 Pedestrian and Bicycle Facilities

A shared-use Class I path for pedestrians and bicyclists consisting of a 10-foot-wide travel way with a 2-foot-wide shoulder would be constructed on the south side of Gilman Street from 2nd Street to the eastern roundabout. The shared-use path would extend south along Eastshore Highway, where it would then connect to a proposed pedestrian and bicycle overcrossing. The overcrossing would be constructed over I-80, merging into the existing Bay Trail that runs

parallel to West Frontage Road. The at-grade shared-use path would continue on the south side of Gilman Street under I-80 and terminate at the Bay Trail on the west side of the interchange.

The pedestrian and bicycle overcrossing would be similar to the existing pedestrian and bicycle overcrossing over I-80 at University Avenue. The structure would be located south of Gilman Street and have a minimum of three spans with a maximum span length of approximately 230 feet over I-80. The foundations for the pedestrian bridge would be located on 2-foot-diameter cast-in-drilled-hole piles 120 feet below the existing ground surface. There would be two staircases incorporated into the overcrossing, one on each side of I-80. They would be approximately 45 feet long with a height of 25 feet to connect to the overcrossing. There would also be retaining walls on the east and west side of the overcrossing; they would be approximately 6 feet tall at the highest point and taper down to zero. The maximum depth of the retaining wall piles is expected to be 50 feet below ground surface.

Improvements would be made to provide bicycle connectivity from 4th Street to Harrison Street to 5th Street between the Codornices Creek Path and the two-way cycle track on Gilman Street. These improvements would consist of painted shared-lane markings, also known as sharrows, on the pavement throughout this corridor. Bicycle signage and pedestrian-scale lighting would be constructed as part of the improvements.

Approximately 125 feet of new curb, gutter, and sidewalk would be constructed beginning at the corner of Harrison Street and 4th Street and ending halfway down the block towards 5th Street. Parallel parking would be added along this new section of curb and sidewalk. The bus stop located at the corner of 4th Street and Gilman Street would be removed.

The project includes a two-way cycle track on the south side of Gilman Street between the eastern I-80/Gilman Street ramps and 4th Street. The two-way cycle track is separated from vehicle traffic with a minimum 3-foot-wide striped buffer and a parking lane in some locations. The addition of the two-way cycle track would require installation of a traffic signal at the intersection of 4th Street and Gilman Street. The northern curb line on Gilman Street would also be shifted 2 to 5 feet north. Along Eastshore Highway, the sidewalk, curb, and gutter would be replaced between Page Street and Gilman Street.

West of the I-80/Gilman Street interchange, the existing Bay Trail would be extended approximately 660 feet west along the south side of Gilman Street from its current terminus at the intersection of West Frontage Road and Gilman Street to just beyond Berkeley city limits. The proposed Bay Trail extension would be 10 feet wide, unstriped, with 2-foot-wide unpaved shoulders on either side of the trail. On-street parking would be reduced by approximately 18 spaces at the end of Gilman Street as a result of the new trail extension.

Additional pedestrian and bicycle improvements include upgrading the 3rd Street/UPRR crossing at Gilman Street to accommodate the cycle track. Improvements would include

relocation of the railroad crossing gate and flashing beacons, addition of a bicycle signal, installation of medians, and improvement of striping and signage. All improvements would be approved by UPRR and the California Public Utilities Commission.

1.2.2 Utilities, Landscaping, and Drainage

Existing Pacific Gas & Electric (PG&E) overhead electric lines along Gilman Street, West Frontage Road, and Eastshore Highway would be relocated as part of the project. Some of these overhead lines may be placed underground. Minor drainage modifications would also be required to conform to the new roundabout alignment, and drainage improvements associated with the two-way cycle track along Gilman Street would also be required. Utility relocations and new drainage systems may require trenching to a depth of approximately 6 feet. New light pole foundations and ramp metering poles would be 2 feet in diameter and would range from 5 to 13 feet deep near the roundabout.

A tidal flap gate would be installed at the existing headwall of the 60-inch RCP at the western terminus of Gilman Street. Additional details regarding installation of the tidal flap gate are provided in Section 1.2.5. Replacement of the existing headwall and associated riprap will include in-water work. Work below the mean high water mark would be required. Dewatering or a cofferdam may also be required.

An existing East Bay Municipal Utility District (EBMUD) recycled water transmission line would be relocated and extended as part of the project. Approximately 1,100 feet of a new 12-inch recycled water transmission pipeline within Eastshore Highway from Page Street to Gilman Street, and approximately 1,050 feet of pipeline within Gilman Street from 2nd Street to the Buchanan Street extension are included in the project scope. The maximum excavation for the pipe trenches would be approximately 24 inches wide by 60 inches deep. Approximately 1,100 feet of an existing 10-inch EBMUD recycled water pipeline located within Caltrans right-of-way along the eastbound Gilman Street off-ramp shoulder would be abandoned in place or removed. A new City of Berkeley sewer line would be installed underneath Gilman Street beginning at a point east of the interchange and ending on the west side of I-80 at the approximate entrance to the Tom Bates Regional Sports Complex parking lots.

Existing vegetation is sparse in the project footprint and consists of ornamental plantings or ruderal vegetation. The project would remove existing landscaping and trees on the sidewalk along Eastshore Highway from Page Street to Gilman Street. In addition, trees and/or shrubs would be removed at the I-80 off-ramps, westbound I-80 on-ramp, and along the Bay Trail. Opportunities for new landscaping or artwork would be available in the center of each roundabout. Replacement plantings would occur near the areas of impact where feasible, as well as within the project limits.

Aesthetic treatment of the roundabout would consider hardscape treatments and the possibility of planting. Final determination would occur during the design phase of the project.

1.2.3 Golden Gate Fields Access

The existing driveway entrance to Golden Gate Fields stables is located immediately adjacent to the westbound I-80 off-ramp at the end of the curb return on Gilman Street. Construction of the roundabout would expand the ramp intersection to the north and would require relocation of the access gate to Golden Gate Fields stables.

Alternate entrance and exit gate options to access Golden Gate Fields stables were evaluated and dicussed with Golden Gate Fields management in a series of meetings.

The project would relocate the entrance and exit gate to the Gilman Street Extension. The existing gate would be connected to Golden Gate Fields Access Road allowing the existing security shed to remain in place. The intersection of Gilman Street Extension with Golden Gate Fields Access Road would be improved, and Gilman Street would be widened to the south to provide space for two two-lane roads separated by a median. The Golden Gate Fields northeast (upper) parking lot would be resized and restriped to allow space for the Gilman Street Extension/Golden Gate Fields Access Road intersection. The existing security shed leading to the northeast and northwest (lower) parking lots would be moved north and reconstructed with new gates. The Golden Gate Fields northwest (lower) parking lot would be restriped to maximize the parking spaces. Both parking lots would be repaved and restriped, and lighting and landscaping elements would be added. Golden Gate Fields Access Road and the Gilman Street Extension would be repaved and restriped between Gilman Street and the northeast and northwest parking lots. Fifteen (15) new parallel parking spaces would be striped along the Gilman Street access road. There would be no net loss of parking for Golden Gate Fields.

1.2.4 Property Acquisitions

The project would require acquisition of portions of right-of-way from Golden Gate Fields and East Bay Regional Park District (EBRPD). Relocation of the driveway currently facing Gilman Street would be required from a private property located on the south side of Gilman Street and 2nd Street. Additionally, a permit to construct from Golden Gate Fields would be required to complete improvements on their property. Temporary construction easements would be required for construction equipment storage, staging, and laydown from EBRPD and various property owners along Gilman Street, 4th Street, Harrison Street, and 5th Street.

1.2.5 Work within the Action Area

Installation of a new tidal flap gate on the 60-inch RCP at the terminus of Gilman Street would consist of the following tasks in and adjacent to the Bay:

- Removal of sediment to recontour the beach

- Removal of RSP and installation of a cofferdam around the existing headwall of the 60-inch RCP
- Removal of the existing headwall and remaining RSP and soil behind the headwall
- Installation of the new headwall and RSP
- Removal of the cofferdam
- Installation of additional RSP and the tidal flap gate

The beach adjacent to the Gilman Street outfall would be recontoured to a lower elevation. Approximately 100 cubic yards of sediment would be excavated from an approximately 0.21-acre area. The sediment grading area is shown in Figure 1-3. All grading would occur at low tide when the beach is dry. Grading would occur either prior to cofferdam installation or following cofferdam removal.

The cofferdam would likely be a sheet pile wall embedded in shoreline substrate immediately downstream from the outfall. Some RSP and sediment would be removed from the cofferdam footprint prior to cofferdam installation. Installation of the cofferdam would take several days, but the sheet piles would only be installed using methods that generate minimal noise, such as vibratory or push methods, during low tides. High tides that occur while the cofferdam is being installed create the potential for fish to become stranded within the partially installed cofferdam (Figure 1-5).

A temporary clear water diversion system may be necessary to dewater the cofferdam and excavated areas that encounter groundwater. Design and management of this system would be in accordance with "Caltrans Storm Water Quality Handbooks, March 1, 2003" Section 7: Construction Site Best Management Practices Manual – Clear Water Diversion NS-5. Installation and removal of this system may disturb the substrate of the Bay. This would result in increased turbidity during high tide and a degradation of water quality. Due to its sandy composition, this material would quickly fall out of suspension. Water quality monitoring would be performed during and after installation and removal of the system to document changes in turbidity in compliance with water quality standards and permits. Therefore, impacts from this system would likely be temporary, minimal, and localized.

Once the cofferdam is installed, soil and RSP would be excavated from behind the headwall and the headwall would be demolished with a jackhammer. Once the existing headwall is removed, a form for the new headwall and wingwalls would be constructed and concrete would be poured into the form. After the headwall and wingwalls have cured enough to hold the slope, approximately 100 to 200 cubic yards of RSP would be placed in upland areas and within Bay waters. The forms and sheet pile cofferdam would be removed after 7 days, allowing the headwalls and wingwalls to cure and placement of RSP in dry conditions. Sheet piles would be removed at low tide.

The tidal flap gate would be installed at low tide after the concrete has reached 28-day strength. The preferred method for installing the tidal flap gate would be to include all anchor bolts in the form before concrete is poured. Alternatively, holes may be drilled into the headwall, after which threaded studs would be screwed into the holes and securely locked in position with epoxy or other means. The tidal flap gate would be hoisted by a crane, mounted, and secured with hex lug nuts.

1.2.6 Construction Activities and Schedule

Construction work for the project would be completed primarily during daylight hours from 7:00 a.m. to 6:00 p.m.; however, there may be some work during night-time hours to avoid temporary roadway closures for tasks that could interfere with traffic or create safety hazards. Work hours along the internal access road within Golden Gate Fields property would only occur from 10:00 a.m. to 5:00 p.m., and night work would be restricted within or adjacent to Golden Gate Fields property. Examples of work activities throughout the project limits include striping operations, traffic control setup, installation of storm drain crossings, and asphalt pavement mill and overlay.

Available staging areas include the existing roadway and Caltrans right-of-way. Additional staging areas may be required west of the project on Gilman Street in one or two parking lots owned by EBRPD. Staging areas are shown in Figure 1-4.

The following types of equipment are anticipated to be used during construction: crane-mounted vibratory hammer, press-in sheet pile system, auger drill rig, backhoe, compactor, concrete pump, crane, dozer, excavator, front end loader, grader, heavy-duty dump trucks, jackhammer, vibratory roller, and pavement breaker.

The in-water work portion of the project is anticipated to take approximately 30 days and start in spring 2019.

1.3 Project Features and Avoidance and Minimization Measures

1.3.1 Project Design Modifications for Avoidance and Minimization

Construction of the tidal flap gate at the Gilman Street outfall was added to prevent backflow of saline water into the Gilman Street outfall. Caltrans Biology also identified a potential benefit of the tidal flap gate in that it would potentially prevent fish from entering the Gilman Street outfall, as this stormwater pipe does not provide any upstream habitat for species under the jurisdiction of NOAA Fisheries. Caltrans Biology worked with the project engineer to minimize the footprint of the in-water work to the greatest extent feasible. A temporary cofferdam was added to isolate the work area and contain turbidity produced during construction from entering the Bay and to prevent fish from entering the work area during high tide events.

1.3.2 Project Features and Avoidance and Minimization Measures

Project Features that protect water quality and the natural environment have been incorporated into the project design and construction methodologies. These Project Features would reduce impacts on habitats and protected species. Additionally, project-specific Avoidance and Minimization Measures (AMMs) would be implemented to protect sensitive natural resources from project activities. A summary of the standard Project Features that would be implemented by Caltrans is listed in Table 1-1. Project-specific AMMs are listed in Table 1-2.

1.4 Mitigation Measures

The proposed action is anticipated to result in minimal effects on listed species, critical habitat, and EFH under the jurisdiction of NOAA Fisheries. Potential effects would be limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new rock slope protection (RSP); water quality impacts from cofferdam operation and sediment removal at the shoreline; and potential entrapment of fish in the work area during cofferdam installation. Although the proposed action may result in minimal permanent effects to federally regulated species and their critical habitat, it would not diminish the potential of the portion of the Bay within the AA as a movement corridor. Caltrans does not propose any compensatory mitigation as part of this project.

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Table 1-1. Project Features

Project Feature	Description
PF-1. Comply with Regulatory Agency Permits and Approvals	• A copy of all relevant permits will be included within the construction bid package of the proposed project. The Resident Engineer or designee will be responsible for implementing the conditions of all biological resources permits. • The names and qualifications of biological monitors will be submitted for (agency) approval prior to initiating construction activities. • Caltrans and Agency-approved biologists will be onsite during work within the Bay, including installation and removal of the cofferdam, as well as installation of the tidal flap gate on the 60-inch culvert, or as otherwise required by regulatory agency permits and approvals.
PF-2. Protect Environmentally Sensitive Areas	• Adjacent to the Bay, project limits will be delineated with high-visibility fencing to avoid ground disturbance adjacent to work and access areas. • Trees, shrubs, and native vegetation will be preserved in place to the extent practicable. • All spoils, excavated materials, and plant materials will be disposed at a licensed and approved facility. • The work in the Bay will be limited to the smallest area possible to complete the proposed construction activities.
PF-3. Provide Environmental Awareness Training	Before project activities, a qualified Caltrans-approved biologist will conduct an education program for all project personnel. Species to be covered will include, but are not limited to, green sturgeon, special-status salmonids, brant, western snowy plover, California least tern, bats, and nesting birds. The program will include: • Information on the protected species and the habitats likely to be found within the BSA. • Requirements of federal and State laws pertaining to these species. • Identification of measures implemented to conserve the species and habitats within the project area. • Distribution of a fact sheet conveying this information to the personnel who may enter the Biological Study Area (BSA).
PF-4. Implement Project Site Best Management Practices (BMPs)	• Access routes and the number and size of staging, access, and work areas will be limited to existing paved, graveled, or other previously compacted surfaces as identified in the project plans. Movement of heavy equipment to and from the site will be restricted to established roadways. • Routes and boundaries will be clearly marked prior to initiating ground disturbance. • All food and food-related trash items, such as wrappers, cans, bottles, and food scraps, must be disposed of in securely closed containers and removed once per week from a construction or project site. • No pets, such as dogs, owned by project personnel will be allowed anywhere in the BSA during work to prevent harassment, mortality of special-status species, or destruction of habitat. • All equipment will be maintained such that there will be no leaks of automotive fluids, such as gasoline, oils, or solvents, and a Spill Response Plan will be prepared. • Hazardous materials, such as fuels, oils, and solvents, will be stored in sealable containers in a designated location that is at least 100 feet from aquatic habitats and storm drain inlets.

Table 1-1. Project Features

Project Feature	Description
	• No firearms will be allowed except for those carried by authorized security personnel, or local, State, or federal law enforcement officials.
PF-5. Replant, Reseed, and Restore Disturbed Areas	Disturbed areas will be restored with the following methods: • All slopes or unpaved areas temporarily affected by the proposed project outside of the sediment grading area will be restored to original topography and stabilized with effective erosion control materials. The permanent postconstruction topography of the sediment grading area will be at a lower elevation due to excavation of sediment; this area will be stabilized following construction. • Slopes and bare ground will be reseeded with native plant seed mix to stabilize and prevent erosion, where appropriate.
PF-6. Control Invasive Weeds	• If species ranked by the California Invasive Plant Council as medium- or high-priority invasive weeds are disturbed or removed during construction-related activities, the Contractor will contain the plant material and dispose of it in a manner that will not promote the spread of the species. The Contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with a local native seed mix. If seeding is not possible, the area will be covered to the extent practicable with heavy, black plastic solarization material until the end of the project. The project will be managed to reduce and minimize the propagation of invasive weeds.
PF-7. Protect Water Quality	The potential for adverse effects to water quality will be avoided by implementing temporary and permanent BMPs outlined in the Caltrans *Construction Site Best Management Practices Manual* (Caltrans, 2017). Caltrans erosion-control BMPs will be used to minimize any wind- or water-related erosion. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges. Protective measures will be included in the contract documents, including, at a minimum: • No discharge of pollutants from vehicles and equipment cleaning will be allowed into the storm drain or water courses. • Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses and storm drain inlets. • Dust control will be implemented, including the use of water trucks and tackifiers to control dust in excavation and fill areas, applying drain rock to temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require. • Work areas where temporary disturbance has removed pre-existing vegetation will be restored and reseeded with a native seed mix. • Graded areas will be protected from erosion using a combination of silt fences, biodegradable fiber rolls along the toe of slopes or along edges of designated staging areas, and erosion-control biodegradable netting such as jute or coir, as appropriate. Biodegradable fiber rolls will be installed along or at the base of slopes during construction to

Table 1-1. Project Features

Project Feature	Description
	capture sediment, and temporary organic hydromulching will be applied to all unfinished disturbed and graded areas. Installation of BMPs with monofilament netting is strictly prohibited. • A water quality inspector will inspect the site before and after a qualifying rain event to ensure that stormwater BMPs are adequate. A rain event is defined to be any storm that produces or is forecasted to produce at least 0.50 inch of precipitation at the time of discharge, with a 72-hour dry period between events. • A cofferdam and dewatering will be used to minimize increases in sediment transport and turbidity during work performed within the Bay. Cofferdams will conform to Caltrans 2018 Standard Specifications Section 19-3.01, and dewatering will be in accordance with "Caltrans Storm Water Quality Handbooks, March 1, 2003" Section 7: Construction Site Best Management Practices Manual - Clear Water Diversion NS-5. If surface water or groundwater inflows are present, a dewatering system will be installed in order to perform work within the cofferdam.
PF-8. Monitor Water Quality	Turbidity monitoring will be performed when grading the shoreline, removal and replacement of RSP, during and after installation and removal of the cofferdam, as well as during dewatering activities according to Standard Specification 13-1.01D(5)(b) Water Quality Sampling and Analysis. Water quality monitoring will be performed to document changes in turbidity in compliance with water quality standards, permits, and approvals from NOAA Fisheries and/or the California Department of Fish and Wildlife (CDFW). If the water quality monitor observes excursions of turbidity beyond 50 nephelometric turbidity units or as otherwise specified in regulatory agency permits and approvals, the water quality monitor will notify the Resident Engineer. The Resident Engineer has the authority to stop all construction work in the area until the appropriate corrective measures have been conducted. Work will resume once it is determined that water quality standards will not be violated.
PF-9. Permanent Design Pollution Prevention Measures	• Drainage features, such as energy dissipation devices (e.g., flared end sections and tee dissipaters), will be considered at drainage outfalls to reduce the velocity and dissipate flows as they discharge from the culvert. • RSP will be placed at culvert outfalls and within drainage ditches and swales where velocities may result in rilling or scouring.

Table 1-2. Avoidance and Minimization Measures

AMM	Description
AMM-1. Conduct Preconstruction Surveys and Biological Monitoring	• Preconstruction surveys for nesting birds will be conducted by a qualified Caltrans-approved biologist no more than 72 hours prior to commencing construction activities during the nesting season (February 1 to September 30). Surveys will cover any potential nesting substrates within 300 feet of construction activity. If an active nest is found during surveys, the qualified Caltrans-approved biologist (who shall be knowledgeable about the behavior of nesting birds) shall consult with CDFW and the United States Fish and Wildlife Service (USFWS) regarding appropriate action to comply with State and federal laws. Active nest sites shall be designated as "Environmentally Sensitive Areas" (ESA) and protected (while occupied) during project construction with the installation of a high-visibility fence barrier surrounding each nest site or other appropriate markers. A qualified Caltrans-approved biologist shall develop buffer recommendations that are site specific and at an appropriate distance, that protect normal bird behavior to prevent nesting failure or abandonment. The buffer distance recommendation shall be developed after field investigations that evaluate the bird(s) apparent distress in the presence of people or equipment at various distances. The qualified Caltrans-approved biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by project construction work. Nest monitoring shall continue during construction until the young have fully fledged (i.e., have completely left the nest site and are no longer being fed by the parents) as determined by the qualified Caltrans-approved biologist. • If it is necessary to prevent birds from nesting at a specific location within the construction area, a nesting bird exclusion plan will be prepared by the Contractor. It will specify what Caltrans-approved exclusion measures can be used under what conditions. The exclusion plan will be approved by Caltrans and/or CDFW and/or USFWS prior to implementation. • No more than 48 hours prior to tree removal, a qualified Caltrans-approved biologist will conduct a preconstruction survey of trees slated for removal for crevices and cavities that can provide bat roosting habitat or support active bat roosts. If active roosts are identified, exclusion devices determined in consultation with CDFW will be implemented. • Within 48 hours prior to any work around the 60-inch culvert outfall into the Bay, including installation of the cofferdam and removal of RSP, a qualified Caltrans-approved biologist will conduct preconstruction surveys for special-status species or otherwise protected species that may occur in the area, such as western snowy plover, California least tern, brant, and marine mammals. • A qualified Caltrans-approved and agency-approved biological monitor will be present during all work within the Bay associated with modifying the outfall of the 60-inch culvert. The biological monitor will be present for installation, operation, and removal of the cofferdam, as well as installation of the tidal flap gate after the cofferdam has been removed. • If a protected species is discovered during preconstruction surveys or during construction within the BSA, the qualified Caltrans-approved biologist will notify the Resident Engineer, who has the authority to stop all construction work on the site until the appropriate corrective measures have been conducted and it is determined that the animal will not be harmed. Caltrans will notify USFWS, NOAA Fisheries, and/or CDFW as required in resource agency permits and approvals.

Table 1-2. Avoidance and Minimization Measures

AMM	Description
AMM-2. Protect Fish, Aquatic Species, and Birds	• Installation of the sheet pile cofferdam will use methods that result in minimal hydroacoustic impacts, such as vibratory or push methods. Impact methods, such as pile driving, will not be used. • Installation and removal of the cofferdam will only occur during low tides to minimize potential impacts on aquatic species. Removal of the cofferdam will likely occur during a single low tide; however, installation of the cofferdam is anticipated to take several days, creating the potential for fish to become stranded within the partially installed cofferdam during normal tidal cycles, which could attract birds. The qualified Caltrans-approved biologist will work with the contractor to install the cofferdam while minimizing the potential for fish stranding. If listed, threatened, or endangered species are identified, the qualified Caltrans-approved biologist will consult with CDFW and/ or NOAA Fisheries to develop and implement an appropriate fish translocation plan. Immediately upon completing installation of the cofferdam, the qualified Caltrans-approved biologist will translocate any non-listed stranded fish outside of the dewatered area. Translocation methods and areas suitable for translocation of fish will be determined in coordination with NOAA Fisheries and/or CDFW, as appropriate. • If nighttime work is required, work lights will be directed away from Bay waters.
AMM-3. Evaluate and Replace Trees	• Tree removal or alterations will be avoided wherever possible. • Prior to any tree removals or alterations, a survey will be conducted to identify potential structural issues that could result in safety hazards and ensure remaining trees can withstand strong winds. • To minimize impacts to nesting bird habitat, all trees removed within the project footprint will be replaced by native trees at a 1:1 ratio. Trees will be replaced in-kind or with trees of other native species; they will be planted close to the original removal location if possible, or at a minimum, within the same city or right-of-way. • Outreach to property owners is ongoing to obtain any necessary approvals for tree removals on private property.

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1.5 Summary of NOAA Fisheries Consultation to Date

The following is a summary of technical assistance to date between Caltrans biologist Matthew Rechs and Caltrans' NOAA Fisheries liaison Darren Howe.

- **April 11, 2018**
  - Initial phone conversation between Mr. Rechs and Mr. Howe about the proposed project and Caltrans' request for NOAA Fisheries technical assistance.

- **August 17, 2018**
  - Phone conversation between Mr. Rechs and Mr. Howe regarding project scope and potential impacts. Mr. Howe requested to see a cursory analysis of project affects, and Mr. Rechs agreed to send a copy of the *Natural Environment Study*. Parties agreed to discuss the project further once Mr. Howe reviewed the information. Based on the project description discussed, Mr. Howe preliminarily thought that the project would 'not likely adversely affect' listed species, but Mr. Howe needed to review the additional information to make his final determination. Mr. Rechs also sent diagrams of the proposed cofferdam that would isolate the flap gate work area from Bay waters during construction.
  - Following the call, Mr. Rechs e-mailed Mr. Howe a summary of the topics that were covered during the phone conversation.

- **September 11, 2018**
  - Mr. Rechs and Mr. Howe had a phone conversation. Mr. Howe stated that he forwarded the *Natural Environment Study* to NOAA Fisheries headquarters for further review of the proposed flap gate. Mr. Howe had more questions for Mr. Rechs about the location and quantity of riprap to be used.
  - Mr. Rechs e-mailed Mr. Howe a summary of their phone conversation.
  - Mr. Howe responded to Mr. Rechs' e-mail that he was in agreement with the written summary from their prior phone meeting.

- **September 17, 2018**
  - Mr. Rechs and Mr. Howe had a phone conversation to discuss potential project impacts of the in-water work for the flap gate.
  - Mr. Howe had the following feedback based on an initial review of the project materials:
    - The only potential effects on fish would be temporary, from installation and removal of the cofferdam.
    - Permanent impacts due to installation of the wingwalls, flap gate, placement of riprap, and recontouring sediment at the outfall are considered insignificant and would not cause entrapment of fish.

  - AMMs, such as work only occurring at low tide, would be implemented, and a bio-monitor would be onsite to inspect for turbidity issues and entrapment of fish within the cofferdam.
  - Caltrans would submit a BA and request a LOC for listed fish species.

- Mr. Rechs summarized Mr. Howe's feedback in an e-mail, and Mr. Howe confirmed that the e-mailed summary provided by Mr. Rechs was accurate and underscored that a key element of this project is that the flap gate will be installed on a storm drain that does not provide any upstream habitat for Endangered Species Act or EFH species under the jurisdiction of NOAA Fisheries.

- **September 18, 2018**
  - Mr. Rechs responded to Mr. Howe's email, and affirmed that the clarification was correct. The storm drain does not provide any upstream habitat for Endangered Species Act or EFH species under the jurisdiction of NOAA Fisheries. Both were in agreement that the current scope of the project will 'not likely adversely affect' listed species.

Chapter 2. Study Methods

2.1 Habitats and Listed and Proposed Species Potentially in the Biological Assessment Action Area

Critical habitat is designated by NOAA Fisheries to protect areas that are essential to the survival of federally listed wildlife species. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Fishery Management Councils work with NOAA Fisheries to develop and implement FMPs. These plans identify the EFH within their jurisdiction. Special-status species include those listed as endangered, threatened, or rare under the Endangered Species Act. Information about habitat types and special-status species under the jurisdiction of NOAA Fisheries that can occur in the AA was obtained from the following sources:

- California Natural Diversity Database (CNDDB) RareFind 5 (CDFW 2018)
- National Marine Fisheries Services (NMFS) Listed Species, Critical Habitat, EFH, and Marine Mammal Protection Act species lists (NMFS 2016b)
- NOAA Critical Habitat Shapefiles
- NOAA EFH Shapefiles
- NOAA EFH Mapper (NOAA 2018)
- Existing literature as cited in the text

The CNDDB was used to query all special-status species with known occurrences within a 5-mile radius surrounding the AA. A 5-mile radius was selected because it includes the eastern side of the central Bay, as well as tributaries immediately east of the AA. No occurrences of species under the jurisdiction of NOAA Fisheries were found in this search area (CDFW, 2018).

The NMFS Listed Species, Critical Habitat, EFH, and Marine Mammal Protection Act Species Data was utilized to query all federally endangered, threatened, candidate, and proposed fish species, as well as designated critical habitat (defined as habitats determined to be essential for the survival of that species) and EFH in the Briones Valley, Oakland East, Oakland West, Richmond, San Francisco North, and San Quentin quadrangles (NMFS, 2016b). A total of 18 federally listed wildlife species under the jurisdiction of NOAA Fisheries is considered to have potential to occur within the six quadrangles surrounding the AA. The NOAA EFH Mapper was also accessed to identify EFH in the AA; the species list generated from this query is provided in Appendix A (NOAA, 2018).

NOAA Shapefiles were used to map critical habitat and EFH within the AA (Figures 2-1 and 2-2). As these large shapefiles are not accurate on the small scale of the AA, the limit of NOAA Fisheries' jurisdiction was mapped as the high tide line (HTL) on these figures.

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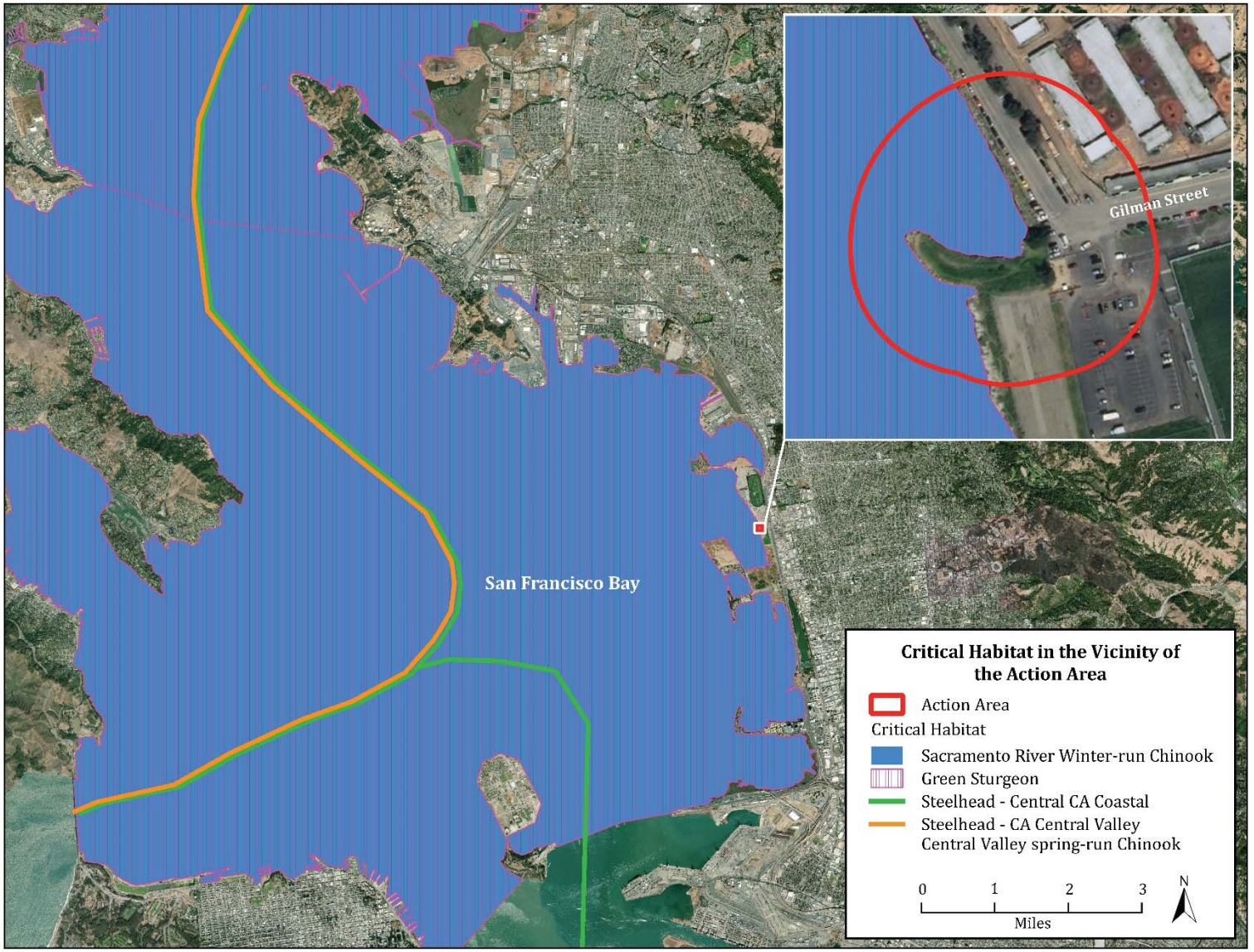

Figure 2-1. Critical Habitat

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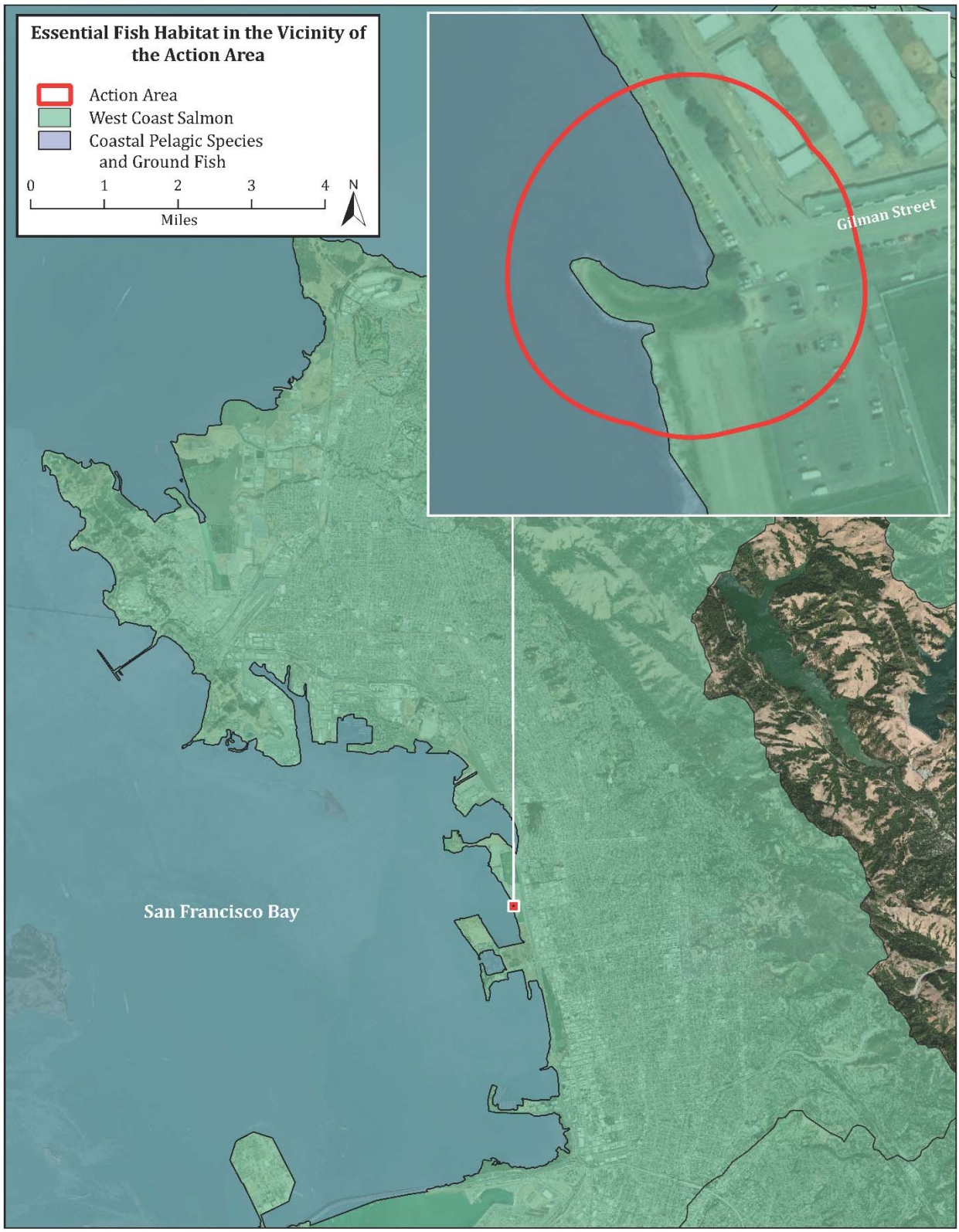

Figure 2-2. Essential Fish Habitat

The FMPs for Pacific Coast Groundfish (Pacific Fishery Management Council [PFMC], 2016b), Coastal Pelagic Species (PFMC, 2018), and Pacific Coast Salmon (PFMC 2016a) were referenced to evaluate potential EFH in the AA. Based on this information, as well as the NOAA Fisheries species list, NOAA EFH and critical habitat shapefiles, and the NOAA EFH Mapper, it was determined that the AA is EFH for the following species:

- Species managed under the Pacific Coast Salmon FMP (Coho and Chinook salmon)
- Species managed under the Coastal Pelagic Species FMP and Pacific Coast Groundfish FMP

These data sources were also used to determine that the AA is critical habitat for the following listed species under the jurisdiction of NOAA Fisheries:

- Green sturgeon – Southern DPS
- Steelhead – Central Valley DPS
- Steelhead – Central California coast DPS
- Chinook salmon – Sacramento River winter-run ESU

Species results from the database searches were refined using available scientific literature, aerial imagery, and site visits to determine which special-status species have the potential to occur within the AA and be affected by the proposed project (Appendix B). If suitable habitat is not present for a sensitive species within the AA, the species was not given further consideration. As the NMFS-listed species quadrangle query included ocean waters west of the Golden Gate Bridge, several species reviewed migrate along the Pacific coast without ever entering the Bay; thus, they were not considered because they have no potential to be present near the AA. For salmonids and green sturgeon, the NOAA species lists for Endangered Species Act-listed Pacific salmon and Endangered Species Act-listed other marine species were consulted for information regarding migration corridors and habitat. Caltrans' *San Francisco-Oakland Bay Bridge East Span Seismic Safety Project Biological Assessment for the Marine Foundations Pier E2, and Piers E21 to E23 Observation Areas, and Piers E19 and E20 Removal Project* was also consulted (Caltrans, 2018a). The following federally listed species under NOAA Fisheries jurisdiction were determined to have the potential to occur and are discussed further in the body of this document:

- Green sturgeon – Southern DPS
- Steelhead – Central California coast DPS
- Steelhead – Central Valley DPS, Federally Threatened
- Chinook salmon – Central Valley spring-run ESU
- Chinook salmon – Sacramento River winter-run ESU

2.2 Studies Required

2.2.1 Land Cover

Vegetation and land cover types and mapping for the AA were conducted using aerial imagery. Vegetation was classified based on the Conservation Lands Network (CLN) Global Information System Database. The Conservation Lands Network is the makeup of the types, amounts, and distributions of habitats that comprise the most essential lands needed to sustain the biodiversity of the Bay Area. The CLN 1.0 Report was initially released in 2011 after a 5-year development process with involvement from 125 organizations and agencies, and the CLN 1.0 Progress Report was released in 2014 (CLN, 2018).

2.2.2 Wetlands

A delineation of jurisdictional waters and wetlands within the AA was conducted on May 18, 2016, in accordance with regulation set forth in 33 CFR Part 328 and the United States Army Corps of Engineers (USACE) guidance documents (Environmental Laboratory, 1987; Lichvar et al., 2016; USACE 1992; USACE 2008). A pre-field review of the AA was conducted to identify potential wetlands and other waters. Existing materials reviewed include geospatial wetlands information provided online by the USFWS National Wetlands Inventory and aerial imagery of the AA and vicinity. The Oakland West USGS 7.5-minute topographic quadrangle map was also reviewed. Soil types in the AA were identified using the Web Soil Survey, a resource provided by the National Resources Conservation Service.

The 2016 delineation did not include Gilman Street and the shoreline of the Bay to the west, which is where the AA is located. The study area was subsequently expanded in late 2017 to include the AA. A field review within the expanded study area occurred in April 2018, and an addendum report (November 2018) to the *Delineation of Waters of the United States* report was prepared to cover the expanded study area.

No streams or wetlands were documented; however, 2.04 acres of Clean Water Act Section 404 regulated waters of the U.S., associated with the Bay, were mapped in the AA. USACE issuance of a verified jurisdictional map is pending.

2.2.3 Wildlife

Preliminary technical studies were conducted to evaluate the potential for special-status wildlife species under the jurisdiction of NOAA Fisheries to occur within the AA. This investigation included review of aerial imagery, CNDDB searches, and NOAA Fisheries species lists (Appendix A) to characterize the potential for distribution and relative abundance of listed wildlife and associated habitats under the jurisdiction of NOAA Fisheries. A site survey of the AA was then conducted on April 11 and May 10, 2018, by biologists Paula Gill, Sadie McGarvey, and Lauren Bingham, and again on April 25, 2018, by biologists Scott Elder and Emily Matthews, to document the habitat and assess the potential for the occurrence of

listed wildlife species. Conclusions regarding the potential for special-status species under the jurisdiction of NOAA Fisheries were based on the existence of known occurrences, habitat quality, and the timing and route of migration corridors (Appendix B).

2.3 Personnel and Survey Dates

Table 2-1 summarizes the survey types, dates, and project personnel involved with biological surveys conducted to date within the AA. The credentials for the personnel listed in Table 2-1 are described below. Site photographs taken during the April 11, 2018 survey are provided in Appendix C.

Table 2-1. Biological Assessment Action Area Survey Dates and Personnel

Survey Type	Date(s)	Areas Surveyed	Personnel
Wetland Delineation	April 11, 2018, May 10, 2018	Outfall of 60-inch culvert at the end of Gilman Street and shoreline of San Francisco Bay	P. Gill, S. McGarvey, L. Bingham
Trees, Botanical	April 25, 2018	Western portion of AA	S. Elder, E. Matthews

The credentials for survey personnel are as follows:

- Scott Elder, B.S. Environmental Geography; 5 years of experience
- Emily Matthews, B.S. Environmental Science; 1 year of experience
- Paula Gill, M.S., PWS Plant Biology, 18 years of experience
- Sadie McGarvey, B.A. Wildlife Biology, 12 years of experience
- Lauren Bingham, B.S. Biological Sciences, 14 years of experience

2.4 Limitations and Assumptions that may Influence Results

All necessary portions of the AA were accessible to biologists. Surveys were conducted during the seasons when special-status species under the jurisdiction of NOAA Fisheries that could occur near the AA would be observable; however, wildlife species may be cryptic, generally difficult to detect, transient, nocturnal, or migratory species that may only occur within the AA for short or fleeting time periods. Wildlife species may only be active during particular times of the year, such as the breeding season, or may only use the AA temporarily as a migration corridor between other areas of more optimal habitat. In addition, all species under the jurisdiction of NOAA Fisheries occur in the Bay, and they are typically not visible from land, except when animals breach the water's surface. For these reasons, wildlife species may be present but not observed. This limitation may influence the study results.

Chapter 3. Results: Environmental Setting

3.1 Project Location

The project is located at the Gilman Street interchange along I-80 between PM 6.38 and 6.95 in the cities of Berkeley and Albany, Alameda County (Figures 1-1 and 1-2). The project is situated in the Richmond 7.5-minute USGS quadrangle. A small portion of this project involves work in the Bay to replace a headwall and install a tidal flap gate on the Gilman Street outfall. The Gilman Street outfall is labeled on Figure 1-2 and is located at the western terminus of Gilman Street along the western edge of the project footprint in the RSP that borders the Bay.

3.2. Project Footprint and Federal Action Area

3.2.1 Project Footprint

The project footprint encompasses the maximum extent of construction-related activities, including ground disturbing, staging, and access. It does not include areas subject to potential indirect effects that could occur from the proposed action. The project footprint is shown in Figure 1-2.

3.2.2 Action Area

The AA is defined as the area (land and water) that may be directly, indirectly, temporarily, or permanently impacted by the proposed action. The regulations governing consultations under the Endangered Species Act define the "Action Area" as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (USFWS, 1998; 51 *Federal Register* [FR] 19957). The AA should be determined based on consideration of all direct and indirect effects of the proposed agency action (USFWS, 1998; 50 CFR 402.02 and 402.14[b] [2]). Therefore, the action area is typically larger than the area directly affected by the action.

For this project, the AA was established to encompass the limits of construction activity (i.e., project footprint) and surrounding areas potentially inhabited by regional special-status species that could be affected by the project, where appropriate. In urban areas, the AA is limited to the project footprint, as there are few to no biological resources, and any biological resources that are present would be habituated to continuous disturbance. In vegetated areas, the AA includes a buffer around the project footprint to include adjacent biological resources that may be indirectly impacted by construction activities. This buffer is generally limited to 50 feet beyond the project footprint. However, nonstandard buffers were included in the AA; the entire spit of land at the end of Gilman Street was included in the AA, as were the staging areas south of the Tom Bates Regional Sports Complex that extend to existing fence lines to the north and south, and to the shore of the Bay to the west. This AA was also used for National

Environmental Policy Act/California Environmental Quality Act document and Clean Water Act consultation.

3.2.3 Biological Assessment Action Area

As part of the proposed project, a tidal flap gate would be installed at the existing headwall of the 60-inch reinforced concrete stormwater outfall pipe at the western terminus of Gilman Street. Replacement of the headwall would require work within the Bay, resulting in potential effects to species, critical habitat, and EFH regulated by NOAA Fisheries. All other project-related activities are within upland areas that do not support any federally listed species that are regulated by NOAA Fisheries. The tidal flap gate work area portion of the AA is the focus of this BA. The AA consists of the footprint of the tidal flap gate work area and an approximate 200-foot buffer around the work area to account for construction-related disturbances that may affect NOAA Fisheries -regulated species. The AA is shown in Figure 1-3.

The center point of the AA is approximately latitude 37°52'39.47"N, longitude 122°18'35.22"W. The limit of USACE jurisdiction in tidal watercourses is defined as 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 high tide line 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 gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high 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.” [33 CFR 328.3]

The combined project AA totals approximately 5 acres of urban development and tidal water. Land use classification for the AA and the amount of acreage that would be temporarily impacted are listed below in Table 3-1 (CLN, 2018).

Table 3-1. Land Use Types within the Biological Assessment Action Area

Land Classification	Acres
Urban Land	2.96
Estuarine	2.04
Total	**5.00**

3.3 Physical Conditions

3.3.1 Regional Setting

The AA is located within the northern portion of the Central Western bioregion of the California Floristic Province, on the northwestern edge of the Diablo Range.

3.3.2 Climate

According to the Köeppen climate classification system, the AA has a Mediterranean climate, characterized by hot, dry summers and mild, moist winters (George, 2015). The AA generally experiences precipitation between mid-October and mid-April. A climate summary for the nearest NOAA weather station with similar elevation and topography to the AA reports the following precipitation and temperature information for the Berkeley Station 040693 (Western Regional Climate Center, 2019):

- Average annual rainfall is 23.41 inches
- Average temperatures range seasonally from 49.2 to 64.9 degrees Fahrenheit (ºF)

The maximum average temperature reported for the project area was 71.8 ºF in September, and the minimum average temperature was 42.7 ºF in December. The wettest month of the year is January with an average rainfall of 4.98 inches, and the driest month is July with an average of 0.03 inch. Winter storms are usually of moderate duration and intensity (Western Regional Climate Center, 2019).

3.3.3 Soils and Topography

The project footprint is located within the eastern edge of the Bay on a gently sloping southwesterly trending alluvial plain. The alignment is situated in the flats west of the East Bay Hills, which are part of the California Coast Range Geomorphic Province. The AA is located at the western edge of the project footprint, where the Bay shoreline is reinforced with large boulders (i.e., RSP). The elevations of the AA in North American Vertical Datum 88 range from approximately 12 feet at the eastern edge of the AA to 4 feet at the shoreline.

The AA consists of artificial fill and alluvial fan and fluvial deposits. Artificial fill (Historic) consists of manmade deposits of various materials and ages. Artificial fill overlies alluvial fan and fluvial deposits (Holocene and late Pleistocene). Depending on location within the project limits, artificial fill could be 5 to 10 feet thick.

Alluvial fan and fluvial deposits consist of sand and clay deposited in valley areas. The deposits likely underlie most of the artificial fill that predominates the AA. The transition from Holocene deposits to late Pleistocene deposits could be between 20 and 30 feet below ground surface. The depth to the base of Pleistocene deposits in the AA is unknown.

The Natural Resources Conservation Service's "Web Soil Survey" (USDA, 2018) classifies the AA as Urban Land and Water; soil composition in the AA is depicted in Figure 3-1. Urban Land is defined as land covered by buildings, roads, parking lots, and other structures. The soil within this unit is heterogeneous fill derived from various sources. Many areas designated under this map unit consist of reclaimed land adjacent to the Bay. The Urban Land soil unit has not been assigned a Hydrologic Soil Group.

Soil at the headwall consists of artificial fills (manmade dumping) having mixtures of sand, silt, clay, and debris with unknown proportions. Young Bay Mud likely underlies the artificial fills. The silt and clay particles in artificial fills are fine and take longer to fall out of suspension than larger particles such as coarse sand.

3.3.4 Hydrology

Runoff from the project footprint is collected and conveyed through a system of storm drains that ultimately discharges into one of three receiving waters: the Bay, Codornices Creek, or Schoolhouse Creek. Figure 3-2 displays a hydrology map of the project footprint, which contains the Gilman Street outfall, a 60-inch reinforced concrete stormwater outfall pipe at the western terminus of Gilman Street. Codornices Creek is adjacent to the northern border of the project footprint, approximately 0.3-mile northeast of the AA. It crosses under I-80 at approximately PM 6.91. Schoolhouse Creek is located outside the project footprint, approximately 0.5 mile south of the AA. It runs under Virginia Street and crosses under I-80 at approximately PM 6.15.

The Alameda County Flood Control and Water Conservation District identifies the AA as within the Gilman Street watershed. The 60-inch RCP is the outfall for the Gilman Street watershed. The Gilman Street watershed consists entirely of underground drainage culverts, which do not provide suitable habitat for fish. Furthermore, Oakland Museum of California watershed maps indicate that the 60-inch RCP and associated tributary drainage systems do not represent a creek or creeks that were historically placed into underground drainage pipes (OMCA, 2018). Therefore, the Gilman Street watershed has never provided suitable aquatic habitat for fish. Although fish or other aquatic species may incidentally enter these underground pipes in the existing condition, the pipes do not provide connectivity to any upstream aquatic habitat either currently or historically.

Senate Bill 857 requires Caltrans to remediate barriers to salmon and steelhead habitat on the State highway system. However, as mentioned previously, the Gilman Street watershed consists entirely of underground drainage culverts that do not provide connectivity to any upstream aquatic habitat either currently or historically. On this basis, installation of a tidal flap gate on the outfall of the Gilman Street watershed is not considered a barrier to fish passage.

Figure 3-1. Soils Map

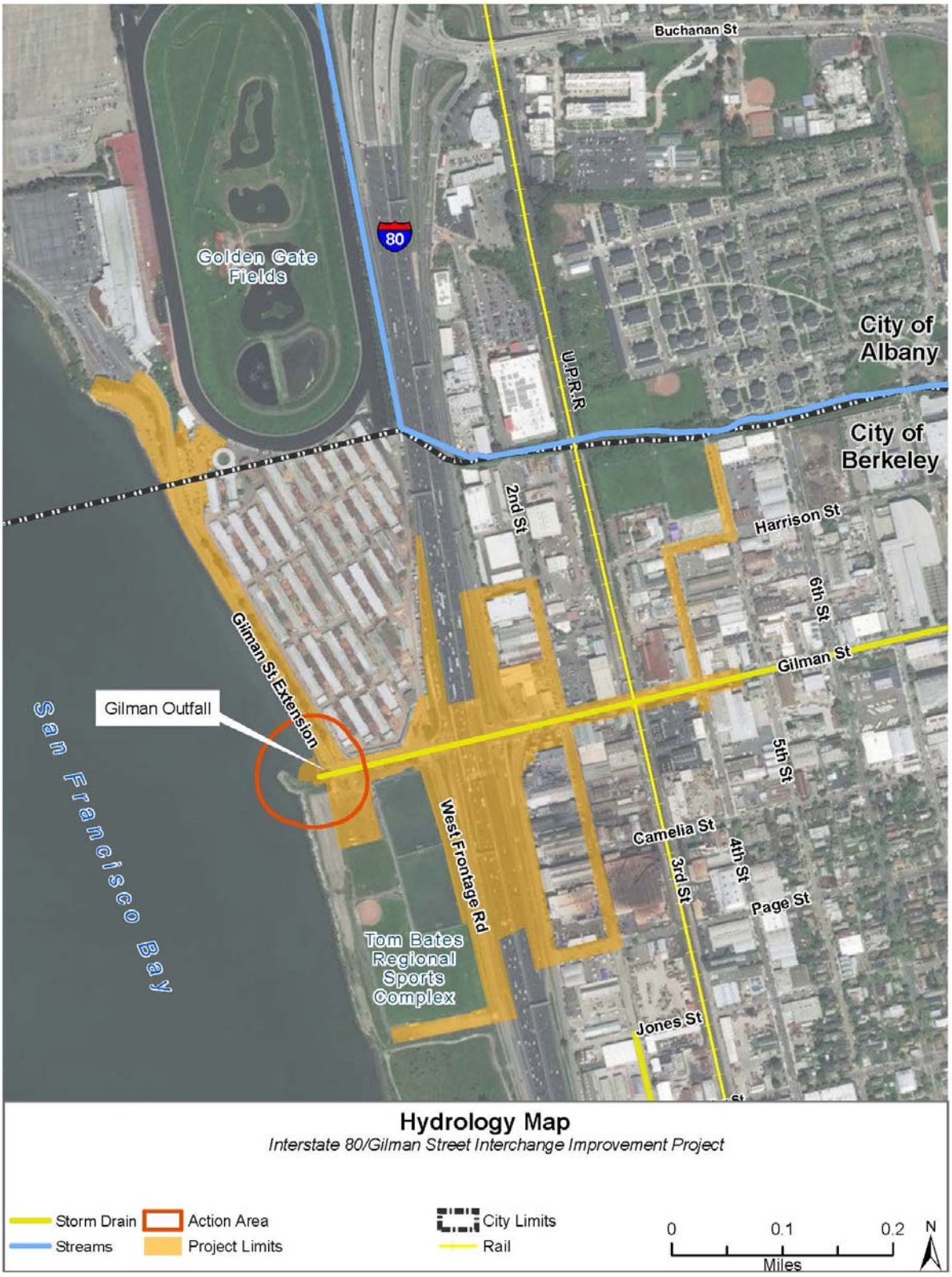

Figure 3-2. Hydrology Map

3.4 Biological Conditions

According to the U.S. Forest Service EcoMap database of Vegetative Provinces and Ecological Subregions, the project footprint is within the California Coastal Chaparral Forest and Shrub Province. This province is characterized by a Mediterranean-like climate of mild, wet winters and hot, dry summers, with a brief period of drought. The landscape is comprised of coastal plains and high hills. Vegetation is a mosaic of woodland (western hardwoods), dwarf-woodland, shrubland species (chaparral-mountain shrub), and annual grasslands cover types (USFS, 2017).

The plant community descriptions and nomenclature conventions within this analysis use California Department of Fish and Wildlife's (CDFW) California Wildlife Habitat Relationships System. This classification system is based on the 59 wildlife habitats described in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988) and may be used as a model to predict which wildlife species may inhabit specific plant communities. Supplemental information was obtained from *California Vegetation* (Holland and Keil, 1995).

The predominant vegetation community in the AA is urban, which includes street trees, planting strips, lawns, and ruderal vegetation. The western margin of the AA is located within the Bay, a tidal estuary. These two vegetation communities comprise the habitats present within the AA. See Figure 3-3 for a map depicting these vegetation communities/habitats within the AA.

3.4.1 Urban

The California Wildlife Habitat Relationships System classifies urban vegetation into five areas: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. Urban areas typically have a small diversity of trees, shrubs, and grasses but greater productivity than natural grasslands due to abundant water and fertilizer (McBride and Reid, 1988). Examples include residential landscapes, golf courses, parks, and school grounds. Non-native landscape species and invasive weeds are common. Within the AA, most of the urban vegetation is limited to ornamental plantings or ruderal species.

Trees within the urban habitat include native and non-native, as well as landscape species consisting of acacia *(Acacia* sp.), apple *(Malus* sp.), ash *(Fraxinus* sp.), birch *(Betula* sp.), blue gum eucalyptus *(Eucalyptus globulus),* maple *(Acer* sp.), myoporum *(Myoporum* sp.), olive *(Olea europaea),* pittosporum *(Pittosporum* sp.), plum *(Prunus* sp.), London planetree *(Platanus hybrida),* evergreen pear *(Pyrus kawakamii),* and California sycamore *(Platanus racemosa).*

The portion of the AA that is classified as urban land does not provide habitat to any special-status species under the jurisdiction of NOAA Fisheries.

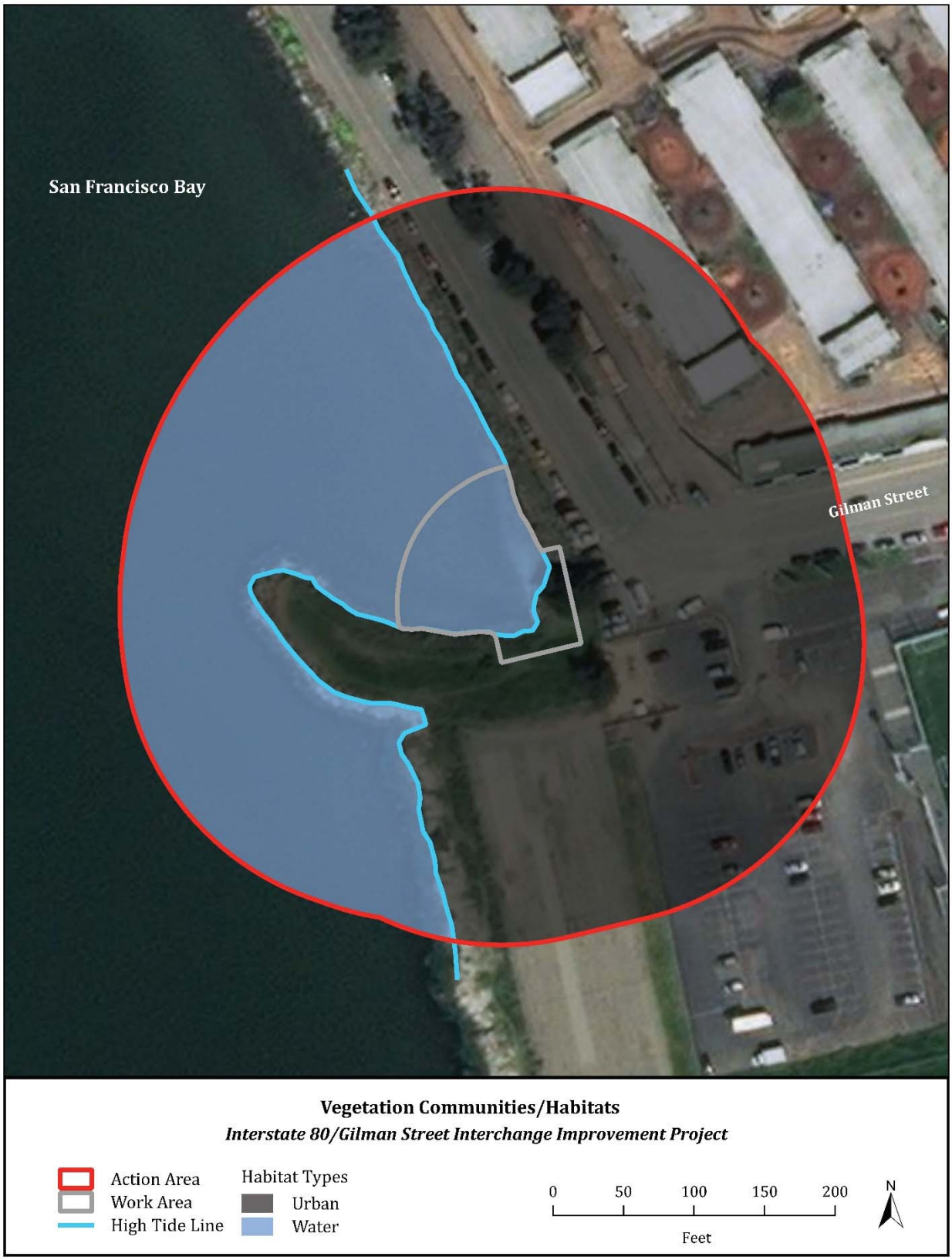

Figure 3-3. Vegetation Communities/Habitats

3.4.2 Estuarine

Estuarine habitats are diverse coastal waterbodies containing a mixture of seawater and freshwater. They may have continuous influxes from marine and landward sources, such as estuaries, tidal flats, eelgrass meadows, or tidal marshes. They may be enclosed, rarely receiving salt water, such as coastal lagoons. In California, coastal lagoons are a common form of estuarine habitat and contain more uniform salinity levels than true estuaries. The Bay region has the largest estuarine system along the Pacific Coast of North and South America, with a vast area of salt marsh (Barbour *et al.*, 2007).

Estuarine habitat within the AA is located just beyond the RSP that forms the existing shoreline of the Bay. Estuaries are highly productive ecosystems, supporting large numbers of invertebrates, fish, and birds. Estuaries provide habitats for the reproduction, feeding, resting, and cover of mammals and birds. Estuaries also provide shelter for large numbers of waterfowl and shorebirds, especially during winter. Eelgrass *(Zostera marina),* a type of submerged aquatic vegetation, is an important component of estuarine systems. There are no known eelgrass beds within the AA; however, eelgrass beds are located approximately 850 feet north of the Gilman Street outfall in the waters of the Bay near Golden Gate Fields (Merkel and Associates, 2014).

Wildlife that can occur in estuarine habitats could include gulls; waterfowl; marine mammals, such as seals and sea lions; a variety of fish and benthic species; and shorebirds in transitional areas between estuarine and terrestrial habitats. Caltrans collected several pelagic and demersal fish species during implosions of the marine foundations as part of the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project (SFOBB Project); the SFOBB Project is located approximately 4 miles south of the AA. Pelagic fish species collected include northern anchovy *(Engraulis mordax),* pacific herring *(Clupea pallasii),* and topsmelt silverside *(Atherinops affinis).* Demersal fish species collected include brown rockfish *(Sebastes auriculatus),* shiner surfperch *(Cymatogaster aggregata),* white surfperch *(Phanerodon furcatus),* plainfin midshipman *(Porichthys notatus),* and yellowfin goby *(Acanthogobius flavimanus)* (Caltrans, 2018b). Special-status anadromous fish under the jurisdiction of NOAA Fisheries that may occur in this habitat type include steelhead, chinook, and green sturgeon.

3.4.3 Habitat Connectivity

Habitat connectivity within the AA is limited due to the presence of dense urban development to the east in Berkeley and Albany. The industrial, commercial, and residential areas to the east of the AA limit habitat connectivity between the Berkeley Hills and the coastal plain adjacent to the Bay. However, the riparian and aquatic habitat associated with Codornices Creek provides a mostly uninterrupted east-west dispersal corridor for wildlife, although several culverts may impede or limit connectivity for both aquatic and terrestrial species.

Bay waters in the western portion of the AA may support green sturgeon and salmonids during migration and/or foraging. The Gilman Street watershed that terminates at the AA consists entirely of underground drainage culverts. Although fish or other aquatic species may incidentally enter these underground culverts, they do not provide connectivity to any upstream aquatic habitat of ecological value.

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1 Habitat

4.1.1 Critical Habitat

The Endangered Species Act establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. When a federal agency's action "may affect" a listed resource, that agency is required to consult with NOAA Fisheries for the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR §402.14(a)). If the action agency concludes that the project is "not likely to adversely affect" listed species and critical habitat, it submits a request for informal consultation to NOAA Fisheries for concurrence. A "not likely to adversely affect" determination is the appropriate conclusion to be made when effects on Endangered Species Act listed species and critical habitat are expected to be discountable (extremely unlikely to occur), insignificant (too small to detect or measure), or wholly beneficial.

Critical habitat is designated by NOAA Fisheries to protect areas that are essential to the survival of federally listed wildlife species. When designating critical habitat, NOAA Fisheries focused on the principal biological or physical features in the defined area that are essential to the conservation of the listed species. These features are termed primary constituent elements (PCEs). The new critical habitat regulations (81 FR 7214, Feb. 11, 2016, codified at 50 CFR 402.02) replaced this term with physical or biological features (PBFs).

The Bay contains critical habitat for the following anadromous fish species that are under the jurisdiction of NOAA Fisheries:

- Green sturgeon – Southern DPS
- Steelhead – Central California coast DP
- Steelhead – Central Valley DPS
- Chinook salmon – Sacramento River winter-run ESU

Critical habitat for Central Valley spring-run Chinook salmon is not present in the action area and thus is not analyzed in this BA.

Critical habitat for the southern DPS of green sturgeon was designated on October 9, 2009 (74 FR 52300; NMFS, 2009) and includes coastal United States marine waters within 60 fathoms (360 feet) depth from, and including, Monterey Bay north to Cape Flattery, Washington; the Sacramento River, lower Feather River, and lower Yuba River in California; the Delta; Suisun Bay; San Pablo Bay; and the Bay. In nearshore coastal marine areas, PBFs for southern DPS green sturgeon are migratory corridor, water quality, and food resources.

Critical habitat was designated for central California coast steelhead and Central Valley steelhead on September 2, 2005 (70 FR 52488; NMFS, 2005c). For central California coast steelhead, PBFs include estuarine areas free of obstruction and excessive predation with the following essential features:

- Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels
- Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation (70 FR 52488)

For central California coast steelhead, critical habitat includes all river reaches and estuarine areas accessible to listed steelhead in coastal rivers from the Russian River to Aptos Creek, and the drainages of the Bay and San Pablo Bay. Also included are all waters of San Pablo Bay west of the Carquinez Bridge and all waters of the Bay to the Golden Gate Bridge.

For Central Valley steelhead, critical habitat includes all river reaches accessible to listed steelhead in the Sacramento and San Joaquin rivers and their tributaries in California (except on tribal lands); river reaches and estuarine areas of the Delta; all waters from Chipps Island westward to the Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay west of the Carquinez Bridge, and all waters of the Bay (north of the SFOBB) from San Pablo Bay to the Golden Gate Bridge.

Critical habitat for Sacramento River winter-run Chinook salmon was designated on June 16, 1993 (58 FR 33212; NMFS, 1993). PBFs that are essential for the conservation of Sacramento winter-run Chinook salmon, based on the best available information, include:

- Access from the Pacific Ocean to appropriate spawning areas in the upper Sacramento River
- Availability of clean gravel for spawning substrate
- Adequate river flows for successful spawning, incubation of eggs, fry development and emergence, and downstream transport of juveniles
- Water temperatures between 6 and 14 degrees Celsius for successful spawning, egg incubation, and fry development
- Habitat areas and adequate prey that are not contaminated
- Riparian areas that provide for successful juvenile development and survival
- Access downstream so that juveniles can migrate from the spawning grounds to the Bay and the Pacific Ocean (58 FR 33212)

Areas of critical habitat include the Sacramento River from Keswick Dam in Shasta County to Chipps Island at the westward margin of the 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 west of the Carquinez Bridge; and all waters of the Bay (north of SFOBB) from San Pablo Bay to the Golden Gate Bridge.

4.1.1.1 Survey Results

All Bay waters within the AA are critical habitat for southern DPS green sturgeon, Central Valley DPS steelhead, central California coast DPS steelhead, and Sacramento River winter-run ESU Chinook salmon (Figure 2-1).

4.1.1.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 that will reduce the potential for effects to critical habitat during and after project construction include:

- Implement Project Site Best Management Practices (BMPs) (PF-4)
- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect Environmentally Sensitive Areas (ESAs) (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AAMs listed in Table 1-2 include:

- Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish (AMM-2)

4.1.1.3 Project Effects

The project activities may affect, but will not adversely modify, critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon. The AA contains approximately 2.04 acres of the Bay that is designated as critical habitat for these species (Figure 2-1). Effects on critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon would be the same because the critical habitat for these species within the AA is limited to the Bay. Critical habitat within estuary habitat is defined by the perimeter of the water body or the elevation of extreme high water, whichever is greater. The lateral extent of critical habitat within the AA used in this analysis is the HTL. As explained in Section 3.2.3, 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.”

Project effects on critical habitat for steelhead, chinook, and green sturgeon would be minimal. Installation and operation of a sheet pile cofferdam would result in a temporary loss of 0.03 acre of critical habitat. Permanent effects would be limited to the loss of 0.01 acre of critical habitat from construction of the new headwall and wingwalls of the Gilman Street

outfall and placement of new RSP. Removal of sediment to recontour the beach would result in the cut of 0.21 acre of sediment; this cut would result in no net loss of critical habitat and is thus not considered permanent loss. Project Features, specifically PF-2, Protect ESAs in Table 1-1, would reduce critical habitat effects by reducing the tidal flap gate work area to the smallest area possible to complete the proposed construction activities. Table 4-1 summarizes the acreage of critical habitat for steelhead, chinook, and green sturgeon that would be temporarily or permanently affected.

Table 4-1. Critical Habitat Effects within the Biological Assessment Action Area

Critical Habitat Type	Source of Effect	Effect Type	Acres of Effect
San Francisco Bay Waters	Cofferdam	Temporary, fill/disturbance	0.03 acre 170 CY
	Sediment removal	Temporary, disturbance Permanent (no loss), cut	0.21 acre 100 CY
	Remove/replace headwall	Permanent, fill	0.001 acre 5 CY
	Remove/replace rock slope protection	Permanent, fill	0.0087 acre 60 CY
CY – cubic yards			

Cofferdam installation, operation, and removal and sediment removal at the shoreline may also result in temporary elevated levels of turbidity; these changes in water quality would be temporary, minimal, and localized to the immediate vicinity of the tidal flap gate work area. Project Features, specifically the features titled Implement Project Site BMPs (PF-4), Protect Water Quality (PF-7), Monitor Water Quality (PF-8), Protect ESAs (PF-2) and Permanent Design Pollution and Prevention Measures (PF-9) in Table 1-1, would reduce impacts on Bay waters. These Project Features would diminish the potential for adverse water quality effects by implementing administrative and engineering controls during the construction phase, as well as slowing or stopping work in the Bay if there is a potential to exceed water quality objectives.

4.1.1.4 Cumulative Effects

No adverse cumulative impacts to critical habitat are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.1.2 Essential Fish Habitat

The MSA (Public Law 104-297) was passed in 1976 for the conservation and management of fishery resources of the United States to prevent overfishing, to rebuild overfished stocks, to ensure conservation, and to facilitate long-term protection of EFH. The MSA (Section 3)

defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The MSA is implemented by regional Fishery Management Councils that work with NOAA Fisheries to develop and implement FMPs. The FMPs must identify the EFH for each fishery within their jurisdiction.

Section 305(b) of the MSA directs federal agencies to consult with NOAA Fisheries on all actions or proposed actions that may adversely affect EFH to obtain avoidance and minimization consultation as well as conservation and enhancement recommendations. Generally, EFH consultation consists of a federal agency notifying NOAA Fisheries regarding an action that may adversely affect EFH (50 CFR 600.920(a)(3)) and providing NOAA Fisheries with an EFH Assessment (50 CFR 600.920(e)), NOAA Fisheries providing EFH Conservation Recommendations to avoid and/or minimize adverse effects to EFH (MSA § 305(b)(4)(A)), and the federal agency responding to NOAA Fisheries’ EFH Conservation Recommendations (50 CFR 600.920(k)(1)).

Adverse effect means any impact that reduces quality or quantity of EFH and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

4.1.2.1 Survey Results

The entire Bay is classified as EFH for species managed under the Pacific Coast Salmon FMP (Coho and Chinook salmon) and for species managed under the Coastal Pelagic Species FMP and Pacific Coast Groundfish FMP (Figure 2-2). Listed salmonids that are managed under the MSA, which may occur within EFH in the AA are limited to Chinook salmon. Pelagic species that are not federally listed but managed under the MSA, which may occur within EFH in the AA include Pacific sardine *(Sardinops sagax)*, Northern anchovy, Pacific herring *(Clupea pallasii pallasii)*, and jacksmelt *(Atherinopsis californiensis)*. Species managed under the Pacific Coast Groundfish FMP but are not federally listed that may be within EFH in the AA include English sole *(Parophrys vetulus)*. Furthermore, estuaries and seagrass communities within the Bay are further defined as a Habitat Area of Particular Concern under the Pacific Coast Groundfish FMP. The nearest seagrass to the AA are eelgrass beds located west of Golden Gate Fields.

4.1.2.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 that will reduce the potential for effects to EFH during and after project construction include:

- Implement Project Site BMPs (PF-4)

- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.1.2.3 Project Effects

The proposed action may adversely affect EFH. Effects on EFH would be the same as those on critical habitat described in Section 4.1.1.3. Table 4-1 summarizes the acreage of EFH that would be temporarily and permanently affected. Project Features would reduce impacts on Bay waters. These Project Features would diminish the potential for adverse water quality effects by implementing administrative and engineering controls during the construction phase, as well as slowing or stopping work in the Bay if there is a potential to exceed water quality objectives.

Additionally, installation of the tidal flap gate on the outfall of the 60-inch culvert would not impede fish passage, because there are no existing surface waterbodies within the Gilman Street watershed that provide suitable habitat for MSA-managed fish species that occur within the AA.

4.1.2.4 Cumulative Effects

No adverse cumulative impacts to EFH are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.2 Federally Listed or Proposed Wildlife Species

As stated in Section 4.1.1, as required by Section 7(a)(2) of the Endangered Species Act, when a federal agency's action "may affect" a listed resource under the jurisdiction of NOAA Fisheries, that agency is required to consult with NOAA Fisheries. If the action agency concludes that the project is "not likely to adversely affect" listed species and critical habitat, it submits a request for informal consultation to NOAA Fisheries for concurrence.

Based on literature review, database searches, and familiarity with the region, three federally listed wildlife species under the jurisdiction of NOAA Fisheries are considered to have potential to occur within the AA (Appendix B). These federally listed wildlife species with low potential to occur include:

- Green sturgeon – Southern DPS, Federally Threatened (71 FR 17757; NMFS, 2005a)
- Steelhead – Central Valley DPS, Federally Threatened (71 FR 834, NMFS, 2006)
- Steelhead – Central California coast DPS, Federally Threatened (71 FR 834; NMFS. 2006)
- Chinook salmon – Central Valley spring-run ESU, Federally Threatened (70 FR 37160; NMFS, 2005b)
- Chinook salmon – Sacramento River winter-run ESU, Federally Endangered (70 FR 37160; NMFS, 2005b)

Green sturgeon is the only species that has the potential to be present within the Bay year-round in low densities. Chinook and steelhead are only present in the Bay during migratory periods, either when adults migrate from the ocean to upstream freshwater breeding habitat or when juveniles out-migrate from natal streams to the ocean. The AA only occupies a small amount (2.04 acres) of suitable habitat (i.e., Bay waters) for these species, and this suitable habitat is absent from the AA two times per day at low tide. As such, these three species have low potential to occur in the AA.

Caltrans also evaluated Central California Coast Coho salmon *(Oncorhynchus kisutch)* but concluded that the project would have no effect on this species because its geographic range does not occur in the AA. There are two creeks in the north-central Bay – the Arroyo Corte Madera del Presidio and Corte Madera in Marin County – that have the potential to support this species. Species transiting from these creeks in Marin County to the Pacific Ocean would likely move through the north side of the Central Bay, making their presence highly unlikely in the AA; therefore, Coho salmon are not discussed further in this analysis.

The following sections discuss each species listed above, including survey results, impacts on each species resulting from implementation of the project, and Project Features and AMMs proposed to protect each species during construction.

4.2.1 Green Sturgeon

NOAA Fisheries has divided the range of the green sturgeon within California into two populations known as DPSs, which are defined as a vertebrate population, or group of populations, discrete from other populations of the species and significant in relation to the entire species. The southern DPS consists of coastal and Central Valley populations south of the Eel River (Humboldt County) and the only known spawning populations in the Sacramento River. The southern DPS green sturgeon is listed as a federally threatened species. Declines in green sturgeon populations are attributed to over harvesting, habitat loss or degradation, and entrainment (Adams *et al.*, 2002).

Very little is known about the historical abundance, diversity, and population status of the green sturgeon. This anadromous species spends more time in the ocean than any other sturgeon species and migrates into rivers to spawn from March to July. The green sturgeon is a slow-growing, long-lived species. Females begin spawning at 17 years of age, and they are

thought to spawn every 3 to 5 years, depositing 60,000 to 140,000 eggs. Spawning occurs on rocky bottom substrates, and juveniles spend 1 to 4 years in freshwater (Adams *et al.,* 2002). Green sturgeons concentrate in coastal estuaries during the late summer and early fall. Their primary food source consists of shrimp, mollusks, amphipods, and small fish. Sedimentation is a threat to this species. For this reason, it is recommended that BMPs be implemented to eliminate or reduce sedimentation during work within or near the Bay.

The Bay and its tributaries contain the southernmost reproductive green sturgeon population (Adams *et al.,* 2002). Adult green sturgeons, those 15 years and older, appear to use the Bay primarily as a migratory corridor to and from their spawning areas in the Sacramento River, although they may stage in San Pablo Bay on their way upstream to spawn. Studies of tagged spawning adult green sturgeons suggest that individuals have rapid transit times from the Golden Gate Bridge to the Sacramento River and spend little time in the central Bay. The earliest arrival date for spawning adults was January 26 and the latest was May 10, with a peak between February and April. Out-migration of adults through the Golden Gate Bridge also appears to be rapid, with departure times between December and February (NMFS, 2016a).

Subadult fish (4 to 15 years old) typically range along the Pacific Coast. They appear to move into estuaries like the Bay during periods of cold water upwelling off the coast, apparently to avoid the cold water. During these periods, subadults may move into the Bay in unpredictable ways. Subadult green sturgeons may occupy the Bay and potentially be present in the AA in summer and may remain in the area for several months between May and October (NMFS, 2016a). Juvenile green sturgeons move throughout the Delta and estuary during their first 3 to 4 years of life before they move into the ocean as subadults. During this early life stage, they may be found in the Bay throughout the year. Juveniles have been found throughout the Bay during trammel net sampling conducted by CDFW.

Due to the timing of migrations and year-round residency of juvenile green sturgeon in the Bay, this species may be present within the Bay year-round in low densities.

4.2.1.1 Survey Results

No focused fish surveys were conducted; however, based on literature review and database searches, there is potential for this species to occur in low numbers within the portion of the AA located in the Bay.

4.2.1.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 will reduce the potential for effects to green sturgeon during and after project construction, such as:

- Provide Environmental Awareness Training (PF-3)
- Implement Project Site BMPs (PF-4)
- Protect Water Quality (PF-7)

- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs listed in Table 1-2 include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.2.1.3 Project Effects

The proposed project, which includes work within the Bay, is required to replace the headwall of a 60-inch culvert that discharges into the Bay at the terminus of Gilman Street, as well as replace RSP, install a tidal flap gate on the outfall, and excavate sediment from the shoreline. A cofferdam would be erected around the work area in the Bay over the course of several days. The cofferdam would likely be a sheet pile wall embedded in the bay mud immediately downstream from the outfall. Potential effects would be direct, limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new RSP; water quality impacts from cofferdam operation and sediment removal at the shoreline; and potential entrapment in the work area during cofferdam installation. Therefore, the proposed project may affect, but will not likely adversely affect green sturgeon.

Measures, such as Protect ESAs (PF-2), Conduct Preconstruction Surveys and Biological Monitoring (AMM-1), and Protect Fish, Aquatic Species, and Birds (AMM-2) would protect green sturgeon during installation of the cofferdam. The in-water work area has been minimized to the greatest extent possible, and cofferdam installation would be timed for low tides. Sheet piles would only be installed using methods that generate minimal underwater noise, such as vibratory or push methods, during low tides. Per Caltrans' 2015 *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish*, vibratory hammers generally produce less sound than impact hammers and are often employed as a mitigation measure to reduce the potential for adverse effects on fish that can result from impact pile driving. In addition, there are no established fish injury criteria for vibration pile driving or push methods (Caltrans, 2015). As such, this method was selected for sheet pile installation to minimize hydroacoustic impacts on green sturgeon.

Project Features outlined in Table 1-1, specifically Implement Project Site BMPs (PF-4); Protect Water Quality (PF-7); Monitor Water Quality (PF-8); Replant, Reseed, and Restore Disturbed Areas (PF-5); and Permanent Design Pollution Prevention Measures (PF-9), would reduce impacts on green sturgeon habitat. These Project Features would diminish the potential for adverse water quality effects by implementing administrative and engineering controls during the construction phase, as well as slowing or stopping construction activities in the Bay

when they result in a potential to exceed water quality objectives. Nevertheless, installation and removal of the cofferdam, excavation of sediment at the shoreline, and removal and replacement of RSP would disturb the Bay floor and have the potential to result in an increase of suspended sediment concentrations during the following high tide. Because the substrate is predominantly sandy, suspended sediment is anticipated to fall out of suspension relatively quickly. Potential changes in water quality from these activities would be temporary, minimal, and localized to the immediate vicinity of the work site.

As described in Tables 1-1 and 1-2, Caltrans would implement Project Features and AMMs that would avoid the take of individual green sturgeon. Measures such as: Provide Environmental Awareness Training (PF-3), Conduct Preconstruction Surveys and Biological Monitoring (AMM-1), and Protect Fish, Aquatic Species, and Birds (AMM-2) would be implemented to ensure that green sturgeon are not present in the work area during installation of the cofferdam. A qualified Caltrans- and NOAA Fisheries-approved biologist(s) would survey the work area cofferdam installation to ensure fish are not present. High tides that occur while the cofferdam is being installed create the potential for fish to become stranded within the partially installed cofferdam. Per the Protect Fish AMM, the biologist(s) will work with the Contractor to install the cofferdam while minimizing the potential for fish stranding and translocate any stranded fish outside of the dewatered area. The cofferdam would be removed during a single low tide event in the least impactful manner. By isolating the tidal flap gate work area from the Bay with a cofferdam and relocating any fish that become stranded inside the cofferdam during installation, Caltrans has determined that there would be no potential for take of individual green sturgeon.

4.2.1.4 Cumulative Effects

No adverse cumulative impacts to green sturgeon are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.2.2 Steelhead – Central California Coast DPS

Steelhead are anadromous salmonids, which means that the adults return to their natal streams to spawn after 1 to 3 years at sea. Adults are silver with pinkish cheeks, darkening during their time in fresh water, and have black spots on their tail, fins, and back. They can reach more than 25 inches in length and up to 12 pounds. Successful spawning and juvenile rearing require certain types of habitat, including coarse, clean, well-oxygenated gravel for spawning and incubation. Excessive accumulations of fine sediment directly affect the viability of eggs, embryos, and juveniles (Barnhart, 1986). After emerging from the gravel, juveniles require cool, clean water that persists through the dry season, a supply of invertebrate food, and shelter for resting and protection from predators. Spawning and juvenile rearing usually take place in the upper reaches of smaller tributaries where suitable spawning gravel is present and cooler water persists throughout the summer months.

The Central California Coast steelhead includes all naturally spawned populations from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, as well as the drainages of the San Francisco and San Pablo bays and their tributaries eastward to Chipps Island at the confluence of the Sacramento and San Joaquin rivers.

Adult steelhead typically migrate from the ocean to freshwater between December and April, peaking in January and February (Fukushima and Lesh, 1998). Spawning takes place from January through April. Juveniles spend from 1 to 3 or more years rearing in their natal stream before migrating to sea as smolts from January through May, with peak migration occurring in April and May.

Due to the timing of migrations through the Bay, this species is absent from the Bay from June through November. Additionally, there are no occurrences of steelhead in CDFW's Bay Study trawl data near the AA from 1980 through 2012.

4.2.2.1 Survey Results

No focused fish surveys were conducted; however, based on literature review and database searches, there is potential for this species to occur in low numbers within the portion of the AA located in the Bay. During a study in 2002 and 2003, a total of 55 juvenile rainbow trout/steelhead were trapped in Codornices Creek; most of these fish were young-of-the-year but the oldest was estimated to be approximately 3 years (Kier Associates, 2003). In 2006, the total population of rainbow trout/steelhead in Codornices Creek was estimated to be 504 individuals (Reguso 2012). While rainbow trout/steelhead have been reported to be present within Codornices Creek, it is not known whether these fish are anadromous steelhead or resident rainbow trout. Lacking confirmation from a fisheries biologist with knowledge of the runs in Codornices Creek, it is assumed that these studies are referring to resident rainbow trout and not the federally endangered, anadromous Central California coast DPS of steelhead. This is supported by a complete lack of steelhead occurrences in CDFW's Bay Study trawl data collected near the BSA between 1980 and 2012.

4.2.2.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 will reduce the potential for effects to Central California Coast steelhead during and after project construction, such as:

- Provide Environmental Awareness Training (PF-3)
- Implement Project Site BMPs (PF-4)
- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs listed in Table 1-2 include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.2.2.3 Project Effects

Potential effects would be direct, limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new RSP; water quality impacts from cofferdam operation, sediment removal, and removal and replacement of RSP at the shoreline; and potential entrapment in the work area during cofferdam installation. Therefore, the proposed project may affect, but will not likely adversely affect Central California coast steelhead. Potential effects on steelhead would be the same as green sturgeon, as described in Section 4.2.1.3.

4.2.2.4 Cumulative Effects

No adverse cumulative impacts to Central California coast steelhead are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.2.3 Steelhead – Central Valley DPS

The basic life history of this DPS is the same as Central California Coast DPS (Section 4.2.2), with the following differences. The California Central Valley steelhead is a federally threatened DPS with no State status. The Central Valley steelhead DPS includes all naturally spawned populations in the Sacramento and San Joaquin rivers and their tributaries, but not San Francisco and San Pablo bays and their tributaries. Steelhead are included in the Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead.

Due to the timing of historic migrations through the Bay, this species is absent from the Bay from June through November. Additionally, there are no occurrences of steelhead in CDFW's Bay Study trawl data near the AA from 1980 through 2012.

4.2.3.1 Survey Results

No focused fish surveys were conducted; however, based on literature review and database searches, there is potential for this species to occur in low numbers within the portion of the AA located in the Bay.

4.2.3.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 will reduce the potential for effects to Central Valley steelhead during and after project construction, such as:

- Provide Environmental Awareness Training (PF-3)

- Implement Project Site BMPs (PF-4)
- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs listed in Table 1-2 include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.2.3.3 Project Effects

Potential effects would be direct, limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new RSP; water quality impacts from cofferdam operation, sediment removal, and removal and replacement of RSP at the shoreline; and potential entrapment in the work area during cofferdam installation. Therefore, the proposed project may affect, but will not likely adversely affect Central Valley steelhead. Potential effects on steelhead would be the same as green sturgeon, as described in Section 4.2.1.3.

4.2.3.4 Cumulative Effects

No adverse cumulative impacts to Central Valley steelhead are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.2.4 Chinook Salmon – Central Valley Spring-Run ESU

There are two distinct types of Chinook salmon; one is found mostly in headwater streams of large river systems, and the other is more commonly found in coastal streams in North America. As juveniles, the stream-dwelling Chinook reside longer (up to 2 years) in freshwater and migrate long distances to the central North Pacific Ocean where they feed and mature, then return to their natal stream to spawn. The ocean-dwelling Chinook tend to use estuaries and coastal areas for juvenile rearing.

Chinook are the largest salmon, with adults weighing more than 40 pounds. Chinook reach sexual maturity between 2 to 7 years. When they reach their natal streams, the female Chinook digs a nest (i.e., redd) by swishing her tail through course gravel in a portion of the stream that has suitable water depth and velocity. After depositing her eggs, the male deposits sperm into the redd. Both protect the redd but die within 25 days after spawning. The eggs hatch in approximately 90 to 150 days.

Chinook ESUs are based on the specific run. Runs are based on the timing of adult migration, as well as the development stage of the fish upon river entry, thermal regime and flow characteristics at the spawning site, and actual time of spawning. Both winter-run and spring-run Chinook salmon tend to enter freshwater as immature fish, migrate far upriver, and delay spawning for weeks or months.

Adult Central Valley spring-run Chinook salmon enter the Bay from the ocean from their upstream migration between February and April. Adult Central Valley spring-run Chinook salmon are not expected near the AA because this area is away from the migratory corridor they use to reach their spawning areas in the Sacramento-San Joaquin Delta. Adults seek deep pools of cool water in streams and rivers, where they spend the summer until spawning in the fall. Peak spawning is in mid-September, with emergence between November and March, with a 3- to 15-month residency time (Moyle *et al.,* 1995). Spring-run juvenile Chinook salmon begin to enter the Bay when they emigrate in spring.

4.2.4.1 Survey Results

No focused fish surveys were conducted; however, based on literature review and database searches, there is potential for this species to occur in low numbers within the portion of the AA located in the Bay.

4.2.4.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 will reduce the potential for effects to Central Valley spring-run Chinook salmon during and after project construction, such as:

- Provide Environmental Awareness Training (PF-3)
- Implement Project Site BMPs (PF-4)
- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs listed in Table 1-2 include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.2.4.3 Project Effects

Potential effects would be direct, limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new RSP; water quality impacts from cofferdam operation, sediment removal, and removal and replacement of RSP at the shoreline; and potential entrapment in the work area during

cofferdam installation. Therefore, the proposed project may affect, but will not likely adversely affect Central Valley spring-run Chinook salmon. Potential effects on juvenile Chinook would be the same as green sturgeon, as described in Section 4.2.1.3.

4.2.4.4 Cumulative Effects

No adverse cumulative impacts to Central Valley spring-run Chinook salmon are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.2.5 Chinook Salmon – Sacramento River Winter-Run ESU

The basic life history of the Sacramento River winter-run chinook is the same as the Central Valley spring-run (Section 4.2.4), with the following differences. The Sacramento River winter-run includes all chinook that naturally spawn in the Sacramento River and its tributaries. This ESU passes through the Golden Gate Bridge beginning in November and continues upstream between December and May. Adult Sacramento River winter-run Chinook salmon are not expected near the AA because this area is away from the migratory corridor they use to reach their spawning areas in the Sacramento River. Spawning occurs from mid-April to August, peaking in May and June in the Sacramento River reach between Keswick Dam and the Red Bluff Diversion Dam. Because this ESU spawns during late spring and summer, they require an adequate supply of cold water for successful reproduction. Sacramento River winter-run Chinook salmon fry begin to emerge from the gravel in late June to early July and continue through October. Juvenile winter-run Chinook salmon spend 4 to 7 months in freshwater prior to migrating to the ocean as smolts. Juveniles migrate downstream from March through July and reach the delta from September through June.

4.2.5.1 Survey Results

No focused fish surveys were conducted; however, based on literature review and database searches, there is potential for this species to occur in low numbers within the portion of the AA located in the Bay.

4.2.5.2 Avoidance and Minimization Measures

Project Features listed in Table 1-1 will reduce the potential for effects to Sacramento River winter-run Chinook salmon during and after project construction, such as:

- Provide Environmental Awareness Training (PF-3)
- Implement Project Site BMPs (PF-4)
- Protect Water Quality (PF-7)
- Monitor Water Quality (PF-8)
- Protect ESAs (PF-2)
- Replant, Reseed, and Restore Disturbed Areas (PF-5)
- Permanent Design Pollution Prevention Measures (PF-9)

Project-specific AMMs listed in Table 1-2 include:

- Conduct Preconstruction Surveys and Biological Monitoring (AMM-1)
- Protect Fish, Aquatic Species, and Birds (AMM-2)

4.2.5.3 Project Effects

Potential effects would be direct, limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new RSP; water quality impacts from cofferdam operation, sediment removal, and removal and replacement of RSP at the shoreline; and potential entrapment in the work area during cofferdam installation. Therefore, the proposed project may affect, but will not likely adversely affect, Sacramento River winter-run Chinook salmon. Potential effects on juvenile Chinook would be the same as green sturgeon, as described in Section 4.2.1.3.

4.2.5.4 Cumulative Effects

No adverse cumulative impacts to Sacramento River winter-run Chinook salmon are anticipated to result from implementation of the project. For a discussion of cumulative impacts from the project as a whole, refer to Section 4.3.

4.3 Project-wide Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area described in this BA. Reasonably foreseeable future and present projects within 1 mile of the AA are summarized in Table 4-2. The projects described in Table 4-2 include transportation improvements, parks and recreation improvements, residential development, and mixed-use projects. Of these project categories, parks and recreation improvements with connectivity to the Bay are the most likely to impact biological resources under the jurisdiction of NOAA Fisheries. In general, transportation, residential, and mixed-use projects would occur in urban or previously developed areas that contain little to no habitat of ecological value, whereas parks and recreation projects involve the modification of open spaces that may provide habitat for special-status or otherwise protected biological resources.

Although there is potential for parks and recreation improvements to impact biological resources, any project that may impact federally listed species under the jurisdiction of NOAA Fisheries would undergo environmental review to avoid or minimize potential effects on biological resources. Projects that occur within any wetland or “Waters of the U.S.” would be required to obtain permits from USACE and the Regional Water Quality Control Board. These permits would ensure that the projects would not result in a net loss of “Waters of the U.S.” or unnecessary impacts on water quality. Any ecological impacts resulting from these projects would be mitigated as part of the environmental review and permitting process.

Considering the reasonably foreseeable future and present projects listed in Table 4-2, as well as the proposed Project Features and AMMs listed in Section 1.3.2, Caltrans has determined the project would result in a negligible contribution to adverse cumulative impacts on protected habitats or special-status species. Species with potential to be temporarily impact by project construction activities in the Bay, special-status fish, and managed fisheries would seek suitable habitat elsewhere in the Bay and adjacent habitats to the north, west, and south of the project site. Disturbed habitat areas would be restored to preconstruction conditions following completion of construction activities to the greatest extent practicable.

The Aquatic Park Improvement Program project listed in Table 4-2 would directly benefit estuarine habitat along the eastern shoreline of the Bay by increasing tidal circulation within the Berkeley Aquatic Park, which is anticipated to result in higher-quality aquatic habitat from improved water quality. Aquatic habitat and water quality improvements may result in beneficial impacts on green sturgeon, steelhead, and Chinook salmon that may reside in this location.

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Table 4-2. Major Projects within 1 Mile of the Biological Assessment Action Area

Name	Jurisdiction	Proposed Uses	Status
Transportation Projects			
University Ave Overcrossing (Increase Vertical Clearance Project, EA 2K830)	City of Berkeley, Caltrans	This project would increase the vertical clearance at the I-80/University Avenue overcrossing to current standard (16.5 feet) by either raising or replacing the existing structure. This would require raising or replacing the on- and off-ramps, as well as the adjacent bridge, to match the new elevation.	Planning
Ashby Ave Connector (Increase Vertical Clearance Project EA 25260)	Cities of Berkeley and Emeryville, Caltrans	The project proposes to reconstruct the Ashby Avenue interchange, which is bordered by Frontage Road and the Bay to the west, an industrial/commercial/residential section of Emeryville to the southeast, and Berkeley's Aquatic Park to the northeast. This project would provide a direct connection between westbound I-80 and Emeryville by way of Shellmound Street and would include a new bridge to replace existing bridges; a roundabout interchange; and provision of bicycle and pedestrian access over I-80 at the Ashby Avenue interchange.	Planning
MBGR Replacement Project between University and Ashby in Berkeley (EA 4G230)	Caltrans	The project would replace sections of Metal Beam Guard Rail, temporary railing Type K, and Type-50 concrete barrier with new Type 60 and Type 732 Concrete Barrier with chain-link fences at eastbound I-80 between the Potter Street on-ramp and University Avenue off-ramp.	Categorical exemption/exclusion signed April 16, 2018
I-80 Safety Lighting & Median Barrier (EA 3J700)	Caltrans	The project proposes to install a median concrete barrier to mitigate glare impact, double luminaire mast arm lighting, and high mast light poles to provide uniform luminosity on I-80 in Alameda County between State Route 13 and 0.4 mile east of the El Cerrito separation.	Planning; first administrative Draft Environmental Document review completed
Park and Recreation Projects			
Aquatic Park Improvement Program (APIP)	City of Berkeley	The APIP consists of a series of capital improvements to Aquatic Park that would improve the hydrology and water quality of the lagoons, wetland and upland habitat, and user amenities, such as improved pathways, seating, overlooks, and interpretive signage. Phase I addresses the water quality and some of the habitat improvements by increasing the water circulation and tidal exchange to bring cooler, more saline Bay water into the lagoons, which would improve habitat for invertebrates and fish, and the birds that feed on them. Phase I also includes removing invasive non-native plant species and replanting with appropriate native plants. Phases 2 through 4 would further improve the upland habitat and would provide user amenities.	Planning and design phase (Draft Environmental Impact Report [EIR] 2012; Final EIR under preparation)

Table 4-2. Major Projects within 1 Mile of the Biological Assessment Action Area

Name	Jurisdiction	Proposed Uses	Status
Proposed Fieldhouse at Tom Bates Regional Sports Complex	City of Berkeley	The preliminary vision of the fieldhouse building consists of a restroom, a meeting room, and a storage area, with a priority on ease of access from the fields, minimal impact to parking, and good security.	Planning and design phase
McLaughlin Eastshore State Park Brickyard Construction	City of Berkeley, EBRPD	Plans are in development for walking trails, picnic areas, restrooms, and parking.	Construction began fall 2018, completed summer 2019
Berkeley Marina Capital Improvement Program	City of Berkeley	Transformative and impactful projects are in progress at the Berkeley Waterfront, and more are on their way. The University Avenue realignment and reconfiguration would improve the road that is the gateway to the Waterfront. Evaluations of the Berkeley Pier are in progress, studying options that would allow this resource to be reopened to the public. A new public restroom, windsurfing area, and landscaped parking lot are under construction at the South Cove Sailing Basin. The Bay Trail is being extended to the Adventure Playground. In fiscal years 2018 and 2019, proposed projects focus on dock and restroom improvements, as well as landscape and real estate planning efforts.	Varies from planning to construction
Albany Beach Restoration and Public Access Project	Cities of Albany and Berkeley	The project involves construction of a 4,983-foot-long (0.94-mile) segment of the Bay Trail between the termini of Buchanan and Gilman streets; expansion of a recreational beach; and improvement of associated park facilities.	Area 1 completed June 2016; Areas 2 and 3 permitting and construction planned for 2019
Residential Projects			
1461-1463 5th Street	City of Berkeley	New townhomes.	Completed
600 Addison Street	City of Berkeley	The project applicant is requesting approval of a master use permit to allow redevelopment of the project site with up to 475,000 gross square feet of research and development and office uses with associated parking, circulation, utility, and landscaping improvements. In addition, the project is requesting conversion of approximately 8,000 square feet of protected warehouse space that was previously removed from the site. Two potential development schemes are currently proposed, with a varied number of buildings and parking and circulation improvements; both schemes, referred to as Scheme 1 (which includes seven buildings) and Scheme 2 (includes five buildings) will be evaluated fully in the EIR.	Notice of Preparation review ended November 27, 2017

Table 4-2. Major Projects within 1 Mile of the Biological Assessment Action Area

Name	Jurisdiction	Proposed Uses	Status
Multi-Use Development Projects			
1900 4th Street	City of Berkeley	Redevelopment of the site with a mix of residential and commercial uses totaling 207,590 gross square feet, as well as associated parking and circulation (148,200 gross square feet), open space and landscaping (16,090 square feet), and utility improvements. The proposed uses would be located within two separate buildings, a three-story building at the corner of 4th Street and Hearst Avenue, and a one- to five-story building on the balance of the site. Approximately 118,370 square feet of residential uses (135 dwelling units) would be located on the second level and above; commercial uses would total approximately 33,080 gross square feet and would be located on the ground level.	Under review with Planning Department
1320 9th Street	City of Berkeley	Create a laboratory/manufacturing facility within existing warehouse.	Permit issued
1285 Eastshore Highway	City of Berkeley	Installation of new Verizon cell tower.	Completed
2100 San Pablo Avenue Residential Care Facility for the Elderly	City of Berkeley	The project involves demolishing the existing two single-story commercial buildings and constructing 75,064 square feet to include 96 residential units (67 studio suits, 20 one-bedroom suites, and 9 two-bedroom suites) group dining and activity rooms, admission offices, staff lounge, wellness and meditation rooms, caregiver stations, a lobby/great room, and a cafeteria. Outdoor space would include a center courtyard measuring 2,174 square feet and outdoor decks on each floor measuring 5,049 total square feet. The center courtyard would abut and be level with the R-1 residential zoning district at the western property line. The proposed commercial component of the project, which would be on the ground floor fronting San Pablo Avenue, would include a beauty salon (319 square feet) an arts and crafts studio (654 square feet), and a geriatric wellness center (853 square feet) intended to serve residents and the elderly in general. In addition, a corner restaurant (1,500 square feet) would serve the Residential Care Facility for the Elderly residents and the general public. Construction would occur over approximately 18 to 22 months.	Negative Declaration, end of review November 13, 2017

Sources: City of Berkeley Planning Department, 2016; ceqanet.com, 2016; City of Berkeley Parks Recreation and Waterfront Department, 2018; East Bay Regional Park District, 2018.

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Chapter 5. Conclusions and Determinations

5.1 Conclusions

The proposed action consists of installation of a tidal flap gate at the existing headwall of the 60-inch RCP at the western terminus of Gilman Street. The tidal flap gate is proposed at the Gilman Street outfall to prevent tidal backflow from entering the outfall pipe. The Gilman Street storm drain system is underground and does not provide suitable habitat for species under the jurisdiction of NOAA Fisheries. Furthermore, watershed maps indicate that the drainage system does not represent a creek that was placed into underground conduits. Therefore, the Gilman Street watershed has never been suitable habitat for listed anadromous fish species or species under the jurisdiction of NOAA Fisheries.

Caltrans has taken every possible opportunity to incorporate reasonable and prudent measures into the proposed action to minimize and avoid effects to listed species and their habitat. The tidal flap gate work area has been designed to affect only the minimal area of disturbance necessary, and the implementation of Project Features and AMMs would minimize effects to potential habitat.

The proposed action is anticipated to result in minimal effects on listed species, critical habitat, and EFH under the jurisdiction of NOAA Fisheries. Potential effects would be limited to temporary loss of habitat during cofferdam installation and operation; minimal permanent loss of habitat from headwall replacement and new rock slope protection (RSP); water quality impacts from cofferdam operation and sediment removal at the shoreline; and potential entrapment of fish in the work area during cofferdam installation. Installation and operation of a sheet pile cofferdam would also result in a temporary loss of 0.03 acre of habitat. Permanent effects would be limited to the loss of 0.01 acre of habitat from construction of the new headwall and wingwalls of the Gilman Street outfall and placement of new RSP. Removal of sediment to recontour the beach would result in the cut of 0.21 acre of sediment; this cut would result in no loss of critical habitat and is thus not considered permanent loss. Project Features and AMMs are proposed as a method by which to limit, to the greatest extent practicable, the potential for the project to result in direct take of federally listed species.

Caltrans considers the temporary and permanent effects from proposed activity to be discountable and insignificant because anticipated levels of disturbance are of short duration (30 workdays) and are minimal in scale. AMMs would protect listed species, critical habitat, and EFH during installation of the cofferdam and excavation of sediment at the shoreline. The in-water work area has been minimized to the greatest extent possible, and cofferdam installation and sediment excavation would be timed for low tides. Sheet piles would only be installed using methods that generate minimal underwater noise, such as vibratory or push methods. Project Features would diminish the potential for adverse water quality effects by implementing administrative and engineering controls during the construction phase, as well

as slowing or stopping construction activities when they result in a potential to exceed water quality objectives. Finally, Project Features and AMMs would be in place to prevent the take of listed species. Worker environmental awareness training, preconstruction surveys, construction monitoring, and fish protection measures would be implemented to ensure that listed fish species are not present in the work area during installation of the cofferdam. A qualified Caltrans- and NOAA Fisheries-approved biologist(s) would translocate any stranded fish outside of the dewatered area. By isolating the tidal flap gate work area from the Bay with a cofferdam and relocating any fish that become stranded inside the cofferdam during installation, Caltrans has determined there would be no potential for take of listed species.

5.2 Determinations

Based on surveys and analysis, Caltrans has made the following determinations:

- The proposed project may affect, but will not likely adversely affect, southern DPS green sturgeon. The small and tidally influenced nature of the work area provides little potential habitat for green sturgeon. Potential effects would be direct, limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, water quality impacts during in-water work, and entrapment in the work area during cofferdam installation. Caltrans concludes that the project would not jeopardize the continued existence of this species. Project Features and AMMs are proposed as a method by which to limit or avoid take to this listed species.
- The proposed project may affect, but will not likely adversely affect, Central Valley DPS steelhead. The small and tidally influenced nature of the work area provides little potential habitat for steelhead. Potential effects would be direct, limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, water quality impacts during in-water work, and entrapment in the work area during cofferdam installation. Project Features and AMMs are proposed as a method by which to limit or avoid take to this listed species. Caltrans concludes that the project would not jeopardize the continued existence of this species.
- The proposed project may affect, but will not likely adversely affect, central California coast DPS steelhead. The small and tidally influenced nature of the work area provides little potential habitat for steelhead. Potential effects would be direct, limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, water quality impacts during in-water work, and entrapment in the work area during cofferdam installation. Project Features and AMMs are proposed as a method by which to limit or avoid take to this listed species. Caltrans concludes that the project would not jeopardize the continued existence of this species.
- The proposed project may affect, but will not likely adversely affect, Central Valley spring-run ESU Chinook Salmon. The small and tidally influenced nature of the work area provides little potential habitat for Chinook. Potential effects would be direct, limited to

temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, water quality impacts during in-water work, and entrapment in the work area during cofferdam installation. Project Features and AMMs are proposed as a method by which to limit or avoid take to this listed species. Caltrans concludes that the project would not jeopardize the continued existence of this species.

- The proposed project may affect, but will not likely adversely affect, Sacramento River winter-run ESU Chinook Salmon. The small and tidally influenced nature of the work area provides little potential habitat for Chinook. Potential effects would be direct, limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, water quality impacts during in-water work, and entrapment in the work area during cofferdam installation. Caltrans concludes that the project would not jeopardize the continued existence of this species. Project Features and AMMs are proposed as a method by which to limit or avoid take to this listed species.
- The proposed project may affect, but is not likely to adversely modify, critical habitat for green sturgeon, Central Valley steelhead, central California coast steelhead, and Sacramento River winter-run Chinook salmon. Potential effects would be direct, limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, and temporary water quality impacts during in-water work.
- The proposed project may adversely affect EFH. Potential effects would be limited to temporary loss of habitat during construction activities, minimal permanent loss of habitat from headwall replacement, and temporary water quality impacts during in-water work.

Caltrans requests NOAA Fisheries concurrence with the determinations outlined above.

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Appendix A. Species Lists from NOAA Fisheries

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NMFS Resources in California

Quad Name **Richmond**
Quad Number **37122-H3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH - **X**
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -

MMPA Pinnipeds - **X**

Quad Name **Oakland West**
Quad Number **37122-G3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH - **X**
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds - **X**

Quad Name **Oakland East**
Quad Number **37122-G2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH - **X**
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds - **X**

Quad Name **Briones Valley**
Quad Number **37122-H2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **San Francisco North**
Quad Number **37122-G4**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - **X**
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - **X**
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) - **X**
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) - X
Olive Ridley Sea Turtle (T/E) - X
Leatherback Sea Turtle (E) - X
North Pacific Loggerhead Sea Turtle (E) - X

ESA Whales

Blue Whale (E) - X
Fin Whale (E) - X
Humpback Whale (E) - X
Southern Resident Killer Whale (E) - X
North Pacific Right Whale (E) - X
Sei Whale (E) - X
Sperm Whale (E) - X

ESA Pinnipeds

Guadalupe Fur Seal (T) - X
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - X
Chinook Salmon EFH - X
Groundfish EFH - X
Coastal Pelagics EFH - X
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - **X**

MMPA Pinnipeds - **X**

Quad Name **San Quentin**
Quad Number **37122-H4**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - **X**
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - **X**
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH - **X**
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds - **X**

Appendix B. Special-Status Species with Potential to Occur

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Table 1. Potential for Special-Status Animal Species to Occur within the BSA

Scientific Name **Common Name**	**Status Fed/State**		**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Invertebrates					
Haliotis cracherodii Black abalone	FE	--	Mid to low rocky intertidal areas in marine intertidal and splash zone communities	**None.** The BSA is not within the range of this species.	No effect. Not present.
Fish					
Acipenser medirostris Green sturgeon – southern DPS	FT	--	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, & Trinity Rivers.	**Low.** Critical habitat is present within the BSA, but suitable sturgeon habitat within the BSA is small in area. There are no records of this species in CNDDB.	May affect, but not likely to adversely affect.
Oncorhynchus kisutch Coho salmon – Central California Coast ESU	FE	SE	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	**None.** Only two creeks that flow into north central San Francisco Bay, Arroyo Corte Madera del Presidio and Corte Madera (Marin County), currently support coho salmon. Individuals migrating to or from these creeks would likely transit through the north side of the Central Bay[1], and are unlikely to be present in the BSA.	No effect. Not present.
Oncorhynchus mykiss irideus Steelhead – central California coast DPS	FT	--	From Russian River, south to Soquel Creek and to, but not including, Pajaro River. Also San Francisco and San Pablo Bay basins.	**Low.** The BSA is within the spawning range of this DPS, and critical habitat is present within the BSA. As an anadromous fish, this DPS occurs in San Francisco Bay when migrating to natal spawning streams in the central California coast.	May affect, but not likely to adversely affect.

[1]NOAA Fisheries. 2001. Biological Opinion. San Francisco- Oakland Bay Bridge East Span Seismic Safety Project. 1514222-SWR99-SR-190.

Table 1. Potential for Special-Status Animal Species to Occur within the BSA

Scientific Name **Common Name**	**Status Fed/State**		**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Oncorhynchus mykiss irideus Steelhead –Central Valley DPS	FT	--	Populations in the Sacramento and San Joaquin rivers and their tributaries.	**Low.** Critical habitat is present within the BSA, but the BSA is not within the spawning range of this DPS. As an anadromous fish, this DPS occurs in San Francisco Bay when migrating to natal spawning streams in the Central Valley.	May affect, but not likely to adversely affect.
Oncorhynchus tshawytscha Chinook salmon – Central Valley spring run ESU	FT	ST	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures above 27 C are lethal to adults.	**Low.** The BSA is not within the spawning range of this ESU. However, as an anadromous fish, this ESU may occur in San Francisco Bay when migrating to natal spawning streams in the Central Valley. A single chinook was observed in Codornices Creek in 2012[2].	May affect, but not likely to adversely affect.
Oncorhynchus tshawytscha Chinook salmon – Sacramento River winter run ESU	FE	SE	Sacramento River below Keswick Dam. Spawns in the Sacramento River, but not in tributary streams.	**Low.** Critical habitat is present within the BSA, but the BSA is not within the spawning range of this ESU. However, as an anadromous fish, this ESU occurs in San Francisco Bay when migrating to natal spawning streams in the Sacramento River. A single chinook was observed in Codornices Creek in 2012[3].	May affect, but not likely to adversely affect.

[2] Bay Nature. 2012. "Chinook salmon sighted in Berkeley creek." https://baynature.org/article/chinook-salmon-sighted-in-berkeley-creek/
[3] Bay Nature. 2012. "Chinook salmon sighted in Berkeley creek." https://baynature.org/article/chinook-salmon-sighted-in-berkeley-creek/

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Scientific Name **Common Name**	**Status Fed/State**	**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Thaleichthys pacificus Eulachon	FT --	Spawn in the lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand and woody debris.	**None.** The BSA is not within the range of this species[4]. There are no CNDDB records within 5 miles of the BSA.	No effect. Not present.
Reptiles				
Lepidochelys olivacea Olive ridley sea turtle	FE/FT --	The olive ridley is mainly a pelagic sea turtle, but has been known to inhabit coastal areas, including bays and estuaries. They are omnivorous, feeding on algae, lobster, crabs, tunicates, mollusks, shrimp, and fish.[5]	**None.** Coastal habitat within the BSA is small in area and consists of sandy shallows. Although olive ridleys are infrequently observed along the California coastline[6], it is highly unlikely that this species would occur in the BSA.	No effect. Not present.
Caretta caretta North Pacific loggerhead sea turtle	FT --	Loggerheads occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Nest on high energy, relatively narrow, steeply sloped, coarse-grained ocean beaches. Most observations in the eastern Pacific Ocean are records of juveniles off the coast of California.[7]	**None.** Coastal habitat within the BSA is small in area and consists of sandy shallows. Although loggerhead turtles are occasionally observed in the San Francisco Bay, it is highly unlikely that this species would occur in the BSA.	No effect. Not present.
Chelonia mydas East Pacific green sea turtle	FT --	Marine. Completely herbivorous; needs adequate supply of seagrasses and algae.	**None.** No suitable marine habitat with an adequate supply of seagrass and algae is present within the BSA. No CNDDB records within 5 miles of the BSA.	No effect. Not present.

[4] NOAA Fisheries. 2008. Summary of Scientific Conclusions of the Review of the Status of Eulachon (*Thaleichthys pacificus*) in Washington, Oregon, and California. http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/other_species/eulachon/eulachon-review.pdf

[5] NOAA Fisheries. 2018a. Olive Ridley Turtle. http://www.nmfs.noaa.gov/pr/species/turtles/oliveridley.html

[6] Bay City News, 2015. "Turtle native to Mexican, Central American coasts seen in Bay Area." http://abc7news.com/news/turtle-native-to-mexican-central-american-coasts-seen-in-bay-area/1141678/

[7] NOAA Fisheries. 2018b. Loggerhead Turtle. http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.html

Table 1. Potential for Special-Status Animal Species to Occur within the BSA

Scientific Name **Common Name**	**Status Fed/State**		**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Dermochelys coriacea Leatherback sea turtle	FE	--	Leatherbacks are mainly a pelagic (open ocean) species, but they also forage in coastal waters. Eats soft-bodied animals, such as jellyfish and salps, and pyrosomes.[8] Often seen feeding on jellyfish in the shipping lanes outside the Golden Gate.[9]	**None.** Coastal habitat within the BSA is small in area, and there is no suitable pelagic habitat present within the BSA. However, vagrants could enter San Francisco Bay and occur in the vicinity of the BSA.	No effect. Not present.
Mammals					
Guadalupe fur seal	FT	--	Live in the waters off southern California and the Pacific coast of Mexico. Breeding grounds almost entirely on Guadalupe Island, Mexico. Uncommon along the West Coast of the United States, but immature animals strand on beaches as far north as Washington State.[10]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.
Balaenoptera musculus Blue whale	FE	--	Found worldwide, from sub-polar to sub-tropical latitudes. Although blue whales are found in coastal waters, they are thought to occur generally more offshore than other whales.[11]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.
Balaenoptera physalus Fin whale	FE	--	Deep, offshore waters of major oceans, primarily in temperate to polar latitudes. Less common in the tropics.[12]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.

[8] NOAA Fisheries. 2018c. Leatherback Turtle. http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.html
[9] Fimrite, P. 2013. "Leatherback turtle sanctuary set up on West Coast." https://www.sfgate.com/outdoors/article/Leatherback-turtle-sanctuary-set-up-on-West-Coast-2664342.php
[10] NOAA Fisheries. 2018d. Guadalupe Fir Seal. https://www.fisheries.noaa.gov/species/guadalupe-fur-seal
[11] NOAA Fisheries. 2016. Blue Whale (*Balaenoptera musculus*). http://www.nmfs.noaa.gov/pr/species/mammals/whales/blue-whale.html
[12] NOAA Fisheries. 2018e. Fin Whale. https://www.fisheries.noaa.gov/species/fin-whale

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Scientific Name **Common Name**	**Status Fed/State**		**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Balaenoptera borealis Sei whale	FE	--	Wide distribution in subtropical, temperate, and subpolar waters. Typically observed in deeper waters far from the coastline.[13]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.
Megaptera novaeangliae Humpback whale	FE	--	Found worldwide. The Mexican population breeds along the Pacific coast of Mexico and feeds from California to the Aleutian Islands. The Central American population breeds along the Pacific coast of Central America and feeds off California and Oregon.[14]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.
Eubalaena japonica North Pacific right whale	FE	--	Historically occurred in all oceans from temperate to subpolar latitudes. Contemporary sightings have mostly occurred in the central North Pacific and Bering Sea.[15]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.
Orcinus orca Southern resident killer whale	FE	--	Found in all oceans. Most abundant in colder waters, they are also found in tropical and subtropical waters. Resident killer whales have been seen from California to Russia.[16]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.

[13] NOAA Fisheries. 2018f. Sei Whale. https://www.fisheries.noaa.gov/species/sei-whale
[14] NOAA Fisheries. 2018g. Humpback Whale. https://www.fisheries.noaa.gov/species/humpback-whale
[15] NOAA Fisheries. 2018h. North Pacific Right Whale. https://www.fisheries.noaa.gov/species/north-pacific-right-whale
[16] NOAA Fisheries. 2018i. Killer Whale. https://www.fisheries.noaa.gov/species/killer-whale

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Scientific Name **Common Name**	**Status Fed/State**	**Habitat Requirements (Descriptions from CNDDB)**	**Potential to Occur within the BSA**	**Effect Finding for Federally Listed Species**
Physeter macrocephalus Sperm whale	FE --	Occur in all deep oceans, from the equator to the edge of the pack ice in the Arctic and Antarctic. Distribution is dependent on food source and suitable conditions for breeding.[17]	**None.** There is no suitable habitat present within the BSA.	No effect. Not present.

[17] NOAA Fisheries. 2018j. Sperm Whale. https://www.fisheries.noaa.gov/species/sperm-whale

Appendix C. Site Photographs

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JOHNSON MARIGOT CONSULTING, LLC
I-80 / Gilman Street Interchange Improvement Project

Site Photo # 1
Gilman Street Outfall (left) and EBRPD Outfall to Remain (right), Looking South

Site Photo # 2
Close-up of Gilman Street Outfall

JOHNSON MARIGOT CONSULTING, LLC
I-80 / Gilman Street Interchange Improvement Project

Site Photo # 3
Gilman Street Outfall, Looking East

JOHNSON MARIGOT CONSULTING, LLC
I-80 / Gilman Street Interchange Improvement Project

Site Photo # 5
View From Flap Gate Work Area, Looking West