US Army Corps
of Engineers®
San Francisco District

Appendix B
Environmental Analysis and Coordination

Contents

1. Wetland Delineation

1.1. Introduction

This report presents the methods and results of a wetland delineation conducted for an approximately 100-acre study area for the Lower Colma Creek Continuing Authorities Program Section 103 Project (project) in San Mateo County, California (Figure 1). The U.S. Army Corps of Engineers San Francisco District (USACE) is exploring coastal storm risk management options in the vicinity of the South San Francisco San Bruno Water Quality Control Plant (WQCP). The purpose of this investigation was to determine the presence and extent of lands within the study area which may be considered waters of the U.S., and therefore subject to regulation under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act. As a baseline, it uses a previous wetland delineation conducted for the Colma Creek Flood Control Maintenance Project (Horizon Water and Environment 2015), and builds on that previous effort to include areas that were not delineated before.

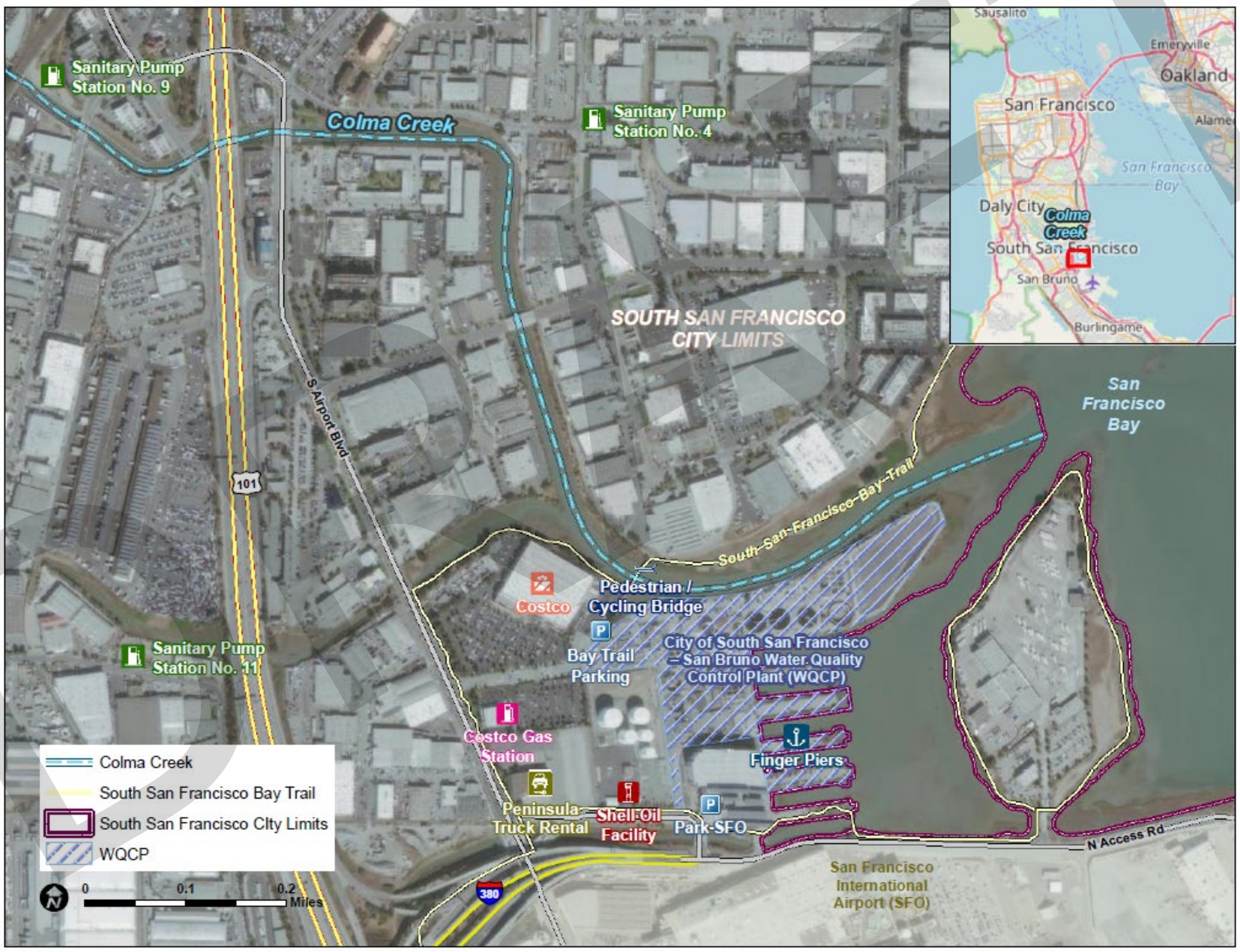

Figure 1. Lower Colma Creek study area.

1.1.1. Study Area

The study area encompasses the reach of Colma Creek adjacent to the WQCP, along with intertidal marsh, mudflat, and estuarine waters near the mouth of the creek. Colma Creek is a perennial stream that flows for approximately 8 miles from its headwaters in San Bruno Mountain State and County Park, through the Cities of Daly City, Colma, and South San Francisco, eventually discharging into San

Francisco Bay (Bay). The entirety of the Bay is considered navigable waters of the U.S. up to mean higher high water (MHHW). Land use in the study area is predominately mixed industrial and commercial, as well as some recreation and open space around the Bay.

1.1.2. Biotic Habitats

Biotic habitats in the study area include: channels, mudflats, rocky intertidal, emergent wetlands, open water, and ruderal/developed areas.

The Colma Creek channel is approximately 150 feet wide adjacent to the WQCP and the Bay. At the mouth of the creek, there is a wetland complex characterized by broad expanses of mudflat habitat with narrow bands of intertidal marsh, rocky intertidal, and upland habitats along the shoreline-Bay ecotone. The mudflats serve as important foraging habitat for many shorebirds. Up until the mid-2000s, this portion of the study area supported large contiguous stands (~50 acres) of non-native, invasive Spartina alterniflora (ISP 2014), which provided habitat for California Ridgway's rail (*Rallus obsoletus*). Clapper Rail density in the study area was considered high for the Bay (0.5 to 3 birds per acre (ISP 2008). Since invasive Spartina control began in 2006, there has been a rapid decline in the number of rails detected in the study area. Recent surveys (2012-2013 and 2018) have failed to detect Clapper Rails (ISP 2013 and BioMaAS 2018), and there is no longer suitable habitat present.

Portions of Colma Creek are within designated Essential Fish Habitat (EFH) for Pacific salmonids. EFH includes areas that were historically accessible to Pacific salmon. Colma Creek does not currently provide spawning or feeding habitat for Pacific salmonids. Although unlikely, salmon could be present in open water portions of the study area near the confluence with the Bay. The lower portions of Colma Creek could potentially provide suitable non-reproductive habitat for longfin smelt and the southern Distinct Population Segment (DPS) of green sturgeon.

1.2. Methods

A wetland delineation was conducted in accordance with the 1987 Corps of Engineers Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008).

1.2.1. Approach

The majority of the study area was delineated for a previous project described above, so the focus of this effort was on two areas outside of that effort – the small wetland between Costco and WQCP, and the south side of the WQCP adjacent to the finger piers. These areas were thoroughly searched by foot for presence of potential wetlands. The extent of highest astronomical tide at the Alameda tide station was used as a starting point for the upland extent of intertidal marsh, and then adjusted based on satellite imagery and field data collection. Wetland boundaries were delineated by employing iterative sampling for wetland indicators (i.e., vegetation, soils, hydrology) across topographic gradients. Representative wetland delineation sample points were established within and up-gradient of the wetland boundary.

1.2.2. Data Collection

The field portion of the wetland delineation was conducted April 18, 2022 during low tide. The data collection procedures followed the methods prescribed in the Arid West Supplement. Vegetation species within the general vicinity (approximately 1 to 3 meter radius) of each sample point were identified by stratum. The wetland indicator status of plant species was determined using the 2014 Regional Wetland Plant List (Lichvar et al. 2014). The soil profile was examined to a depth of approximately 14 inches. Soils were characterized by evaluating texture and color within each distinct layer of the profile. Soil color was described using a Munsell Soil Color Chart. Redoximorphic features were noted and characterized, here present. Each sampling location was examined for evidence of wetland hydrology. Indicators of wetland hydrology include saturation, high water table, debris deposits, etc. Depth to saturation and standing water in soil pits were noted, where present. The locations of sample points were mapped using the Avenza Maps application.

Wetland boundaries were delineated using an iterative process that involved field-based mapping and desktop analysis of aerial photographs. The GPS data were projected in Geographical Information System (GIS) with a recent (2020) aerial photograph as a base map. The GIS and aerial photography were used to further delineate wetland boundaries based on the field indicators. The map developed in GIS was then field evaluated and revised to reflect any discrepancies with field conditions.

1.3. Results

This wetland delineation added approximately 14 acres of jurisdictional waters and wetlands of U.S. to the study area. The jurisdictional areas in the study area are shown in Figure 2 below. These additional areas are summarized below, with the most data given for the intertidal marsh and adjacent upland areas where wetland delineation data sheets were filled out.

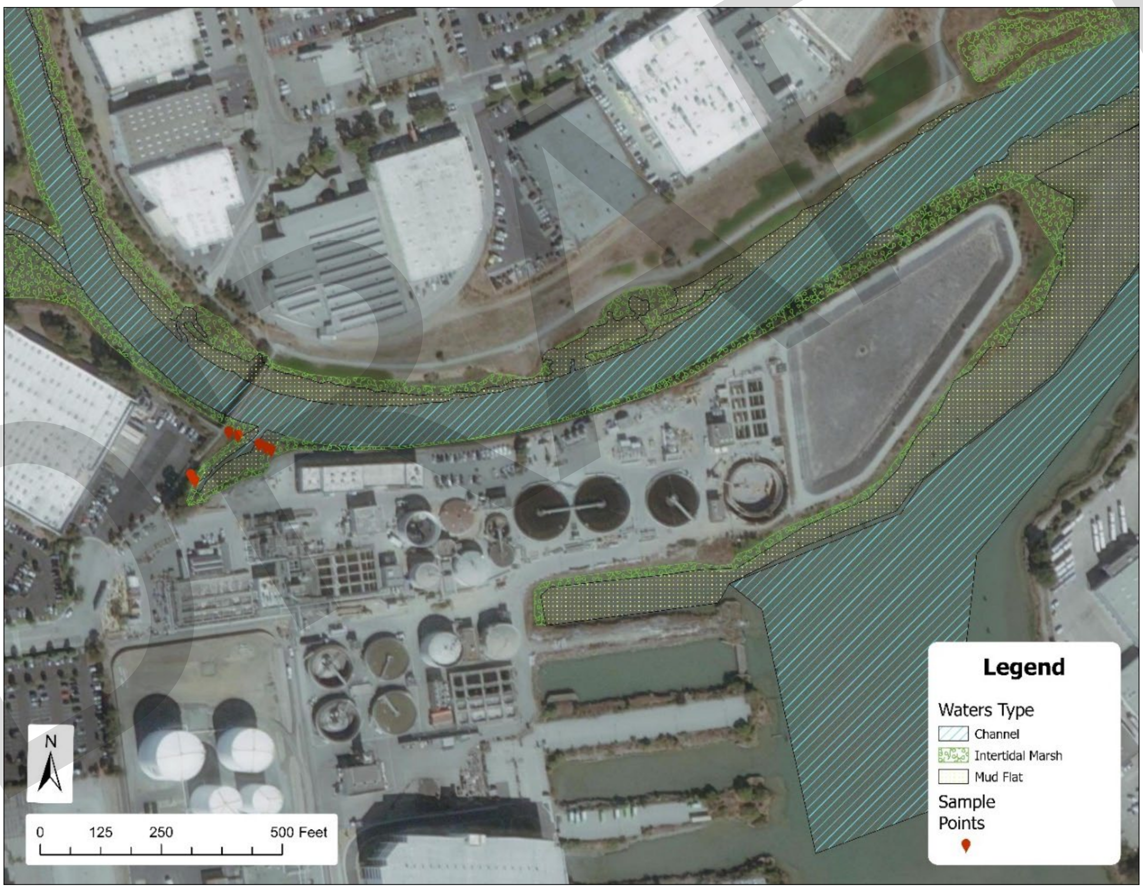

Figure 2. Wetlands and Waters of the U.S. in the vicinity of the study area.

1.3.1. Non-wetland Waters

There were approximately 9 acres of Channel added to the wetland delineation. This includes a smaller area in the wetland adjacent to Costco and Bay Trail, and a larger area designated as channel south of the WQCP in the large embayment where San Bruno Creek empties into the Bay.

Intertidal mudflat includes non-vegetated or sparsely vegetated (< 25% cover) areas between MLLW and approximately 2 feet above MLLW. There were approximately 4.35 acres of Mudflat added to the wetland delineation, generally located between Channel and Intertidal Marsh areas.

1.3.2. Wetlands

Wetlands in the study area include areas of intertidal marsh on the margins of Colma Creek, in the marsh complex near the mouth of the creek, and elsewhere along the margins of the WQCP. 0.86 acres of intertidal marsh were added to the wetland delineation. The wetland delineation sample points are summarized below. Wetland delineation datasheets are available if requested.

Point 1a is located on the south bank of Colma Creek approximately 70 feet northwest from the WQCP lab facility building. Vegetation included iceplant (*Carpobrotus edulis*, UPL), stinking chamomile (*Anthemis cotula*, FACU), and yellow sweetclover (*Melilotus indicus*, FACU). With these plants, the point did not meet either the prevalence or dominance tests. Soils were a light brown clayey loam with some potential fill and angular gravel near the surface. This sample point is not considered to be within a wetland due to the dominance of upland plants, lack of hydric soils (dominance of fill), and lack of hydrologic indicators.

Point 1b is located approximately 10 feet downslope from point 1a. Dominant plant species here included pickleweed (*Sarcocornia pacifica*, OBL) and alkali heath (*Frankenia salina*, FACW). The soil had a loamy gleyed matrix (F2) and depleted matrix (F3). The soil was saturated very close to the surface (A3) and there was a very high water table visible (A2). This point was determined to be within a wetland.

Point 2a is also located on the south bank of Colma Creek, adjacent to the Bay Trail pedestrian bridge. The dominant vegetation was iceplant and field brome (*Bromus arvensis*, FACU), and there was some pickleweed and hairy gumplant (*Grindelia hirsutula*, FACW) present. The soil had a sandy texture and had minor redoxomorphic features present, but there were no hydrology indicators present. This sample point is not considered to be within a wetland due to the dominance of upland plants, lack of hydric soils, and lack of hydrologic indicators.

Point 2b is located approximately 10 feet downslope from point 2a, and had a lot of the same characteristics as point 1b. Pickleweed was the dominant vegetation, but there was also some saltgrass (*Distichlis spicata*, FAC) present. The soil was saturated and had a depleted matrix and there was a high water table. This point was determined to be within a wetland.

Point 3a is located approximately 120 feet southwest from point 2a, adjacent to the Bay Trail and near the head of the small marsh between Costco and the WQCP. Dominant vegetation in the herb stratum was salt grass and field brome, and this under a canopy of red willow (*Salix laevigata*, FACW). The soil had two distinct horizons, with a layer of duff present that appeared to be dumped there, but did not show any wetland soil indicators. There were also no hydrology indicators present. This sample point is not considered to be within a wetland due to the dominance of upland plants, lack of hydric soils, and lack of hydrologic indicators.

Point 3b is located approximately 5 feet downslope of point 3a. It is in a pickleweed marsh sharing many of the same vegetation, soil and hydrology indicators as points 1b and 2b. It was determined to be within a wetland.

The sampling plan also included points along the southern edge of the WQCP peninsula, but these were not sampled to avoid disturbing a large number of bird nests in the sample area. Instead, the highest astronomical tide boundary and satellite imagery were used to determine the upslope extent of intertidal marsh.

1.4. Conclusion

A wetland delineation was conducted for an approximately 100 acre study area to supplement a previously conducted wetland delineation. This wetland delineation identified approximately 14 acres or jurisdictional wetlands and waters of the U.S. Wetlands and non-wetland waters of the U.S. mapped in the study area may be subject to regulation under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act.

The results of this wetland delineation were used to refine the project designs to avoid all impacts to jurisdictional waters and wetland. Because of this, a Section 404(b)(1) alternative analysis has not been conducted for this project.

1.5. References

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2. Biological Assessment

2.1. Introduction

The purpose of this Biological Assessment/Essential Fish Habitat Assessment (BA/EFHA) is to review the project in sufficient detail to determine the extent to which the proposed action may affect (a) any threatened, endangered, or candidate wildlife and fish species regulated by the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS); (b) designated critical habitat of those species; and (c) Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act. This sub-appendix is meant to serve as the basis for informal consultation under USACE's requirements for the Endangered Species Act (ESA) and Magnussen Stevens Fisheries Conservation Act (EFH).

2.2. Project Description

The project's recommended plan includes a 2,000-foot-long I-wall (sheetpile) floodwall, approximately 3 to 4.5 feet above grade at WQCP at the north side of the WQCP adjacent to the right-bank of Creek, as well as a second 700-foot-long floodwall approximately 4 feet above grade on the south side of the plant adjacent to San Francisco Bay. The sheetpile flood walls will be topped with a concrete cap. The footprint of disturbance will be limited to four feet on either side of the wall centerline. At Pump Station 4, a perimeter sheetpile floodwall, approximately 2 feet above grade, would be constructed, with stop log gate for vehicular access and early warning system so that plant operators would know when to seal the stop log gate.

Alternative 2 meets the CSRM objectives of managing risk to human life and safety by managing the risk of the WQCP and Pump Station 4 flooding, up to an extreme tide elevation of 12.34 ft during a 0.2% AEP event with 50 years at the Intermediate SLR rate from the base year of 2023, with a wall crest elevation of 13.5 ft. This prevents flooding through the low spots on the north side from the Colma Creek channel and through the low spots on the south side of the WQCP area. The WQCP is still susceptible to overland flow from the west, but this flooding was found to enter the WQCP area only at extreme tide elevations greater than 13 ft. This would allow plant operators to keep the plant operational and avoid emergency releases of raw sewage into Colma Creek and San Francisco Bay due to plant shutdowns. It would also manage the risk of coastal flooding causing raw sewage to back up into homes and streets if pump stations were to fail or the plant were to not be able to accept pumped sewage.

Figure 3. Floodwall alignment on main property of WQCP.

2.3. Federally Threatened and Endangered Species

To help determine ESA listed species potentially present on the site, an IPaC Species Search was conducted in November 2021 to determine USFWS-managed species potentially present in the project area. Of these species, the majority do not have any potential to be in the project area, and so were not analyzed in detail. The species (and associated critical or essential fish habitats) that have been documented in the project area or nearby are analyzed in further detail below. Much of the species account information shown below is adapted from the biological assessment for the USACE South Bay Shoreline Phase I Study (H.T. Harvey and Associates 2014).

2.3.1. California Ridgway's Rail

General Distribution

The California Ridgway's rail is a secretive marsh bird that is currently endemic to marshes of the San Francisco Bay. It formerly bred at several other locations, including Humboldt Bay (Humboldt County), Elkhorn Slough (Monterey County), and Morro Bay (San Luis Obispo County), but it is extirpated from all sites outside of the San Francisco Bay.

Recently, Ridgway's rail surveys have been conducted by the ISP and its partners to assess the impacts of invasive Spartina treatment on Ridgway's rails (OEI 2011). The ISP evaluated the trend of Ridgway's rail populations at 33 marshes south of the Bay Bridge that were surveyed annually between 2005 and 2011 (OEI 2011). Between 2004 and 2006, during the peak invasive Spartina infestation, Ridgway's rail numbers were at their highest, with a peak of approximately 400 detections during the spring of 2007. Rail detections declined with the reduction in Spartina and only 129 rails were detected in 2011 at these 33 sites, suggesting Ridgway's rails occupied sites infested with invasive Spartina, but their populations declined subsequent to treatment. Because the majority of the treatment sites were surveyed between 2009 and 2011 by the ISP, a more comprehensive Estuary-wide analysis of California Ridgway's rail population trends at 132 sites was conducted during that timeframe. The number of Ridgway's rail detections at these sites varied by year, but the overall number of detections was similar between 2009 and 2011, with 276-376 rails detected in 2009, 293-384 in 2010, and 267-349 in 2011 (OEI 2011). The most notable declines in rail detections were in San Leandro Bay and on the San Francisco peninsula, where invasive Spartina removal was greatest (OEI 2011). The project area (located on the San Francisco peninsula) is a good example of where this decline was observed. Despite a relatively consistent population at the Estuary scale, rail detections appear to be highly variable between years, suggesting there is substantial annual variability in local distribution and abundance of Ridgway's rails in the Estuary. This variability in rail occupancy was documented prior to Spartina eradication efforts as described above and likely dependent on other habitat variables.

Habitat and Biology

Ridgway's rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass (*Spartina foliosa*), gumplant (*Grindelia stricta var. angustifolia*), saltgrass (*Distichlis spicata*), jaumea (*Jaumea carnosa*), and adjacent upland refugia. Shrubby areas adjacent to or within these marshes are also important for predator avoidance at high tides.

Evens and Page (1983) concluded from research in a northern San Francisco Bay marsh that the Ridgway's rail breeding season, including pair bonding and nest construction, may begin as early as February. Field observations in South Bay marshes suggest that pair formation also occurs in February in some areas. The end of the breeding season is typically defined as the end of August, which corresponds with the time when eggs laid (during renesting attempts) have hatched and young are mobile. The Ridgway's rail builds a bowl shaped platform nest of marsh vegetation and detritus (DeGroot 1927, Harvey 1988, Foerster et al. 1990). Ridgway's rails typically feed on benthic invertebrates, but the diet is wide ranging, and includes seeds, and occasionally small mammals such as the harvest mouse.

Dispersal or movements by Ridgway's rails in California occurs between and outside of marshes (Orr 1939, Zembal et al. 1985, San Francisco Bay Bird Observatory [SFBBO] 1986, Page and Evens 1987, Albertson 1995). Eddleman (1989) identified movements by Yuma Ridgway's rails outside of their territories as juvenile dispersal; dispersal by an unmated individual bird; and shifts in home ranges after breeding, in winter, and during high water periods; and attributed these movements to a search for more suitable habitat where territories, mates, food, or safe refuge were better available. Juvenile dispersal apparently constitutes the main type of long distance movements by light-footed Ridgway's rails, while adult birds tend to stay within territories once they are established (Zembal and Massey 1988, Zembal et al. 1989, Ledig 1990, Zembal 1990, Zembal 1994, Zembal et al. 1996, Zembal et al. 1997, Zembal et al. 1998). Similarly, adult Ridgway's rails tend to stay within established territories or home ranges year-round (SFBBO 1986, Albertson 1995). However, territory size varies seasonally. Rohmer (2010) found that home range size of California Ridgway's rails was approximately 1.16 to 1.75 ha within a given season and 2.04 to 4.04 ha on an annual basis. Overton (2014) found that median territory size of California Ridgway's rails ranged from 0.93 ha in December to 1.45 ha in June, with more variation in home range size in winter. Zembal and Massey (1988) noted that three of six radio-tagged light-footed Ridgway's rails that moved extensively were preyed upon within a relatively short period of time. By comparison, seven other birds that remained sedentary within established territories were not preyed upon during the telemetry period. Long-distance movements have been documented in California Ridgway's rails in the Estuary.

Threats

The Ridgway's rail was listed as endangered primarily because of habitat loss. An estimated 40,191 ac of tidal marshes remained in 1988 of the 189,931 ac of tidal marsh that historically occurred in the Estuary;

this represents a 79 percent reduction from historical conditions (Goals Project 1999). The suitability of many remaining marshes for Ridgway's rails is limited and in some cases precluded by their small size, fragmentation, and lack of tidal channel systems and other micro-habitat features. These limitations render much of the remaining tidal marsh acreage unsuitable or of low value for the species. This has also been exacerbated by the necessity to treat areas of marsh for the ISP, which resulted in those areas being converted to mudflat temporarily.

Habitat Status and Distribution in the Project Area

A small population of the California Ridgway's rail was reported from salt marsh habitat of San Bruno Point in 1975, however it is unlikely that the small areas of pickleweed in the project vicinity are sufficient in size to support a local population of this subspecies (CSSF, 1997). Survey results from the 2012 Invasive Spartina Project (ISP) confirmed no observances of the California Ridgway's rails in or adjacent to the project area (Olofson Environmental, 2012). The last observance of a California Ridgway's rail was in 2011 at the navigable slough northwest of the project area. A more recent survey (2018) from BioMaAS, Inc confirmed that there are no rails currently living in the project area. This status is likely to persist until the native *Spartina* becomes reestablished in the marshes near the WQCP.

2.3.2. San Francisco Garter Snake

General Distribution

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) is found on the San Francisco peninsula in San Mateo and Santa Cruz counties. The historical range extended from approximately the San Francisco-San Mateo County line south along the base of the Santa Cruz Mountains into northern Santa Cruz County. Within this area, populations may have principally occupied the Buri Buri Ridge along the San Andres Rift and south in an arc from the San Gregorio-Pescadero highlands west to Tunitas Creek. From here, San Francisco gartersnake populations extended along the west coastline of the Peninsula. A population at San Bruno Mountain may have once represented the northeastern portion of the range, though this record may have been the result of the translocation of individuals from other locations to San Bruno Mountain by amateur herpetologists in order to protect them from development at their original location, and there are no recent sightings at this location. The lack of aquatic habitat at San Bruno Mountain (currently or in early maps) supports the idea that the individuals seen here may have been translocated. Also relatively near to the project area, there is a sizable population of the San Francisco garter snake at the West-of-Bayshore property south and west of San Francisco International Airport (USFWS 2020).

Habitat and Biology

The species inhabits marshlands that border ponds and sloughs, riparian cover along streams, and bordering meadows with scattered brush. Aquatic habitat, including sag ponds, creeks, marshes, canals, and other water sources, is used for foraging and basking, with requirements related to water depth, inundation period, salinity, and associated vegetation. They use terrestrial habitat that is contiguous to aquatic habitat to regulate its body temperature (thermoregulate), estivate, find cover, forage, mate, and hibernate.

San Francisco gartersnakes use both visual and chemical cues to forage, feeding primarily on California red-legged frogs (*Rana draytonii*) and Sierran treefrogs (*Pseudacris sierra*; also Sierran chorus frog). Other prey taken to a lesser degree include western/California toad (*Anaxyrus boreas halophilus*), slender salamander (*Batrachoseps attenuatus*), small fish, newts, annelids, and even rodents (USWFS 2020).

Threats

Alteration and isolation of habitats resulting from urbanization was identified as the primary reason for decline of San Francisco gartersnakes. Habitat loss and the degradation of remaining habitat continue to be the primary threats to the species' recovery. Contributing factors include urbanization and associated habitat fragmentation, seral succession, and hydrologic changes, including drought. Illegal collection, depredation by invasive species, small population sizes, and fungal diseases are also ongoing threats to snake's survival and recovery (USFWS 2020).

Habitat Status and Distribution in the Project Area

Because their primary food source is freshwater amphibians, the San Francisco garter snake does not have suitable habitat in the fringe salt marshes surrounding the WQCP.

2.3.3. Central California Coast Steelhead

General Distribution

Steelhead (*Oncorhynchus mykiss*) are found along the entire Pacific Coast of the United States. The Central California Coast (CCC) steelhead Distinct Population Segment (DPS) includes all naturally spawned populations of steelhead in coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley.

Habitat and Biology

The steelhead exhibits extremes in life history strategies depending on their environment. While all steelhead hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams, some stay in fresh water all their lives. Individuals with this resident life history are called rainbow trout. Others migrate to the ocean as juveniles and return as adults to the freshwater streams and rivers of their birth in order to spawn. Individuals with this anadromous life history are called steelhead.

In California, juveniles usually live in freshwater for 2 years (Barnhart 1986) with a range of one to 3 years (Shapovalov and Taft 1954, Busby et al. 1996) then smolt and migrate to the sea; because of this multi-year rearing time period, steelhead can only spawn in tributaries that maintain suitable temperature and other water quality parameters year-round. Most downstream smolt migration takes place between February and June. Fukushima and Lesh (1998) report the peak timing of steelhead smolt outmigration in Central California occurs in March, April, and May, while Barnhart (1986) reports most steelhead smolts in California enter the sea in March and April.

Steelhead usually spawn in gravel substrates in clear, cool, perennial sections of relatively undisturbed streams. Preferred streams typically support dense canopy cover that provides shade, woody debris, and organic matter, and are usually free of rooted or aquatic vegetation. Steelhead are capable of surviving in a wide range of temperature conditions. They usually cannot survive long in pools or streams with water temperatures above 70° F, but they can use warmer habitats if food is available, such as at fast water riffles where fish can feed on drifting aquatic invertebrates. They do best where dissolved oxygen concentration is at least 7 parts per million. Steelhead in some coastal estuaries in central California apparently make extensive use of estuarine habitats for foraging (Bond et al. 2008), although the extent of the use of estuarine habitats by steelhead in many areas, including the south San Francisco Bay, is virtually unknown.

Threats

Steelhead populations in many areas have declined due to degradation of spawning habitat, introduction of barriers to upstream migration, over-harvesting by recreational fisheries, and reduction in winter flows due to damming and spring flows due to water diversions (NMFS 1997).

In a recent survey of coastal drainages south of San Francisco Bay, steelhead populations were either extinct or reduced in size from historical levels in at least half of the 168 surveyed mainstem streams and primary tributaries (Titus et al. in prep). In addition, only 14 percent of the streams had steelhead present where there was no discernible, significant change from historical production levels. Steelhead in most tributaries to San Francisco and San Pablo bays have been virtually extirpated (McEwan and Jackson 1996). In a 1994 to 1997 survey of 30 San Francisco Bay watersheds, steelhead occurred in small numbers at 41 percent of the sites, including the Guadalupe River, San Lorenzo Creek, and Corte Madera Creek (Leidy 1997). Current evidence (post-1992) indicates that steelhead use 134 (48 percent) of 278 San Francisco Bay tributary streams surveyed, with an additional 17 streams (6 percent) that may currently support steelhead (Leidy 2007).

Industrial and municipal wastes have been discharged into the San Francisco Bay, although large-scale pollution was partially relieved by the passage of the Clean Water Act in 1972 that resulted in the construction of new sewage treatment plants in the cities around San Francisco Bay including the WQCP in the project area. However, non-point sources of pollution, such as urban runoff and fine sediment, continue to degrade water quality. These contaminants may be impairing physiological development of juvenile salmonids and reducing their survival during the oceanic phase.

Habitat Status and Distribution in the Project Area

Colma Creek in the study area is a tidal channel that has water in it year-round. It has hardened banks, bars with marsh vegetation and mudflats that are exposed at low tide. Leidy (2007) identifies five fish species that live in Colma Creek, two of which are native (threespine stickleback and staghorn sculpin) and three of which are non-native (rainwater killifish, western mosquitofish and yellowfin goby). Insufficient information exists to assess the historical distribution of salmonids in the Colma Creek watershed. The watershed currently does not contain suitable habitat to support salmonids (Leidy et al. 2005). However, there could be migrating adults or rearing juveniles that utilize the tidal portions of the creek.

Critical Habitat

Designated critical habitat for CCC steelhead includes all tidal habitat within the project area (NMFS 2005). One of the primary constituent elements (PCEs) of critical habitat essential to the conservation of the species is present within the Action Area. This PCE consists of estuarine areas that include:

1. Areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater.
2. Natural cover such as aquatic vegetation, and side channels.
3. Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

These features are essential to conservation because without them juveniles cannot reach the ocean in a timely manner and use the variety of habitats that allow them to avoid predators, compete successfully, and complete the behavioral and physiological changes needed for life in the ocean. Similarly, these features are essential to the conservation of adults because they provide a final source of abundant forage that will provide the energy stores needed to make the physiological transition to fresh water, migrate upstream, avoid predators, and develop to maturity upon reaching spawning areas. Although Colma Creek includes these PCEs for CCC steelhead (albeit in a somewhat degraded form), juvenile steelhead are expected to make limited use of the project area. The habitat along channel margins is often not inundated except during high tides, making the tidal marsh inaccessible much of the time. However, the tidal marshes along these sloughs likely provide cover from predation when submerged during higher tides.

2.3.4. Green Sturgeon

General Distribution

Green sturgeon (*Acipenser medirostris*) are the most broadly distributed and wide-ranging species of the sturgeon family, occurring in ocean waters from Ensenada, Mexico to the Bering Sea, and commonly occurs in coastal waters from San Francisco Bay to Canada. The actual historical and current distribution of where this species spawns is unclear because the original spawning distribution may have been reduced due to harvest and other anthropogenic effects and because they make non-spawning movements into estuaries during summer and fall (Lindley et al. 2008). Actual spawning has been documented (by the presence of juveniles) in the Rogue (Erickson et al. 2002), Klamath, Trinity (Scheiff et al. 2001), Sacramento, and Eel rivers (Lindley et al. 2008).

Habitat and Biology

Green sturgeon are long-lived, slow-growing fish and the most marine-oriented of the sturgeon species. Green sturgeon have delayed sexual maturity, somewhere between 13 and 20 years, and apparently only spawn every 2-5 years (Moyle 2002). They likely live to a maximum age of 60-70 years (Moyle 2002).

Juveniles reside in fresh water, with adults returning to freshwater to spawn when they are more than 15 years of age and more than 4 ft in size. Spawning is believed to occur every 2-5 years (Moyle 2002). In the Sacramento River, they spawn in late spring and early summer. Adults typically migrate into fresh water beginning in late February; spawning occurs March-July, with peak activity in April-June (Moyle et al. 1995). Juveniles spend 1-4 years in fresh and estuarine waters before migrating to the ocean (Beamesderfer and Webb 2002).

Green sturgeon are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. In summer and fall, they commonly occur in estuaries where there has been no known spawning activity and where there are no records of their occurrence farther up the river system (Adams et al. 2007), suggesting that the species may wander widely in accessible estuarine habitat. Studies in the Sacramento-San Joaquin Delta found that juveniles feed on opossum shrimp and amphipods (Radtke 1966) and adults feed on benthic invertebrates, and even small fish (Moyle et al. 1995).

Green sturgeon spawn in deep pools or "holes" in large, turbulent, freshwater rivers (Moyle et al. 1995). Specific spawning habitat preferences are unclear, but it is likely that cold, clean water and suitable substrate (large cobble, but also clean sand and bedrock) are important for spawning and embryonic development (Moyle et al. 1995). In the lab, temperatures ranging from 11-17° C were optimal for hatching and developing embryos (Van Eenennaam et al. 2005). Because of these habitat preferences, it is unlikely that South Bay tributaries provided suitable habitat for freshwater-dependent life stages.

Threats

Potential threats or risk factors for the southern green sturgeon DPS include the concentration of spawning in the Sacramento River and the apparent small population size; loss of spawning habitat; harvest bycatch concerns; potentially lethal water temperatures for larval green sturgeon; entrainment by water projects in the Central Valley; and the adverse effects of toxic materials and exotic species (Adams et al. 2002). The principal threat to the southern DPS comes from the reduction of green sturgeon spawning to a single area in the Sacramento River (Adams et al. 2007). Impassible barriers (e.g., Shasta and Keswick dams) currently block green sturgeon from significant potential spawning habitat in the three major branches of the Sacramento River: the Little Sacramento River, the Pit River system, and the McCloud River (Adams et al. 2007). Little is known about current population size and data on population trends are lacking.

Habitat Status and Distribution in the Project Area
There is no evidence that the green sturgeon has ever spawned in Colma Creek or other nearby water bodies. Based on this species' preferences for streams having strong flow over large cobbles in deep pools, it is unlikely that Colma Creek historically provided suitable spawning habitat, and such habitat is certainly absent now. However, given that green sturgeon are known to wander in estuaries away from spawning streams, individuals (particularly juveniles) could occasionally forage in tidal waters of the project area.

Critical Habitat
Critical habitat for Southern DPS of green sturgeon was designated on 9 October 2009 and includes all tidally-influenced waters of the San Francisco Bay (NMFS 2009). The PCEs essential for the conservation of the Southern DPS of green sturgeon that may occur in estuarine habitats within the Action Area include:

1. Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.
2. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
3. A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.
4. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

Similar to the situation for steelhead, the PCEs for green sturgeon in the project area are in a somewhat degraded state relative to their habitat needs.

2.3.5. Essential Fish Habitat
Under Section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, federal agencies are required to consult with NMFS on any actions that may adversely affect EFH. All subtidal and intertidal habitats within Colma Creek, are designated as EFH for a number of species federally-managed under the following three FMPs:

- Coastal Pelagic FMP – northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), mackerel, squid
- Pacific Groundfish FMP – leopard shark (*Triakis semifasciata*), English sole (*Parophrys vetulus*), starry flounder (*Platichthys stellatus*), and other elasmobranchs (e.g., big skate [*Raja binoculata*], soupfin shark [*Galeorhinus galeus*], spiny dogfish [*Squalus acanthias*])
- Pacific Salmon FMP – Chinook salmon (*Oncorhynchus tshawytscha*)

Coastal Pelagic FMP Species
Northern Anchovy: Despite great fluctuations in annual abundance, northern anchovy is the most abundant fish species found within the San Francisco Bay/Estuary. Spawning appears to occur in deeper channels and sloughs while larvae and juveniles are found over the productive shallows, including ponds. Eggs tend to be found in water with salinities from 32-35 ppt, but juveniles and adults are abundant in fresher bays and estuaries as well as marine waters.

Pacific Groundfish FMP

Leopard Shark: This species is the most abundant shark in San Francisco Bay, being found especially around piers and jetties. Estuaries are used as pupping and feeding/rearing grounds. Leopard sharks are most common on or near the bottom in waters less than 4 m deep and are most abundant in embayments and estuaries, although other habitats include flat, sandy areas, mud flats, and bottoms strewn with rocks near rocky reefs or kelp beds and around jetties and piers.

English Sole: Adult and juvenile English sole are abundant throughout central and southern San Francisco Bay. Adults and juveniles prefer soft bottoms composed of fine sands and mud. Optimum conditions for larval survival are salinities of 25-28 ppt and temperatures of 8-9º C. Juvenile distribution within San Francisco Bay is limited to temperatures between 12.8 and 14.5° C and salinities between 12 and 24 ppt (Baxter 1999). Temperatures around 18° C appear to be the upper thermal tolerance for juvenile English sole and they move to deeper and cooler waters as intertidal temperatures approach and exceed 20°C in late spring (Baxter 1999).

Starry Flounder: Juvenile and adult starry flounder are very common in Central and South San Francisco Bay. Juveniles in South San Francisco Bay are commonly found in shallow water, including shoals, intertidal areas, and tidal marshes. Transforming larvae and juveniles migrate from the coast to brackish or freshwater nursery areas, where they rear for one or more years. Age-0 starry flounder appear to seek warm (16.4 to 22.6° C), low salinity (<22 ppt) rearing habitats. As they grow, juveniles move to water of higher salinity. Juveniles prefer sandy to muddy substrates, and adults prefer sandy to coarse substrates. Adults are most common in the Bay from late spring through early fall.

Pacific Coast Salmon FMP Species

Chinook Salmon: Chinook salmon are not native to Colma Creek, but could occur as foraging individuals that have strayed from Central Valley runs or releases of hatchery-raised fish from Central Valley runs. There also could be stopovers from outmigrating juveniles. Juveniles can move quickly through estuaries or reside there for months. Juveniles can tolerate water temperatures been 0 and 26° C, but a range of 12-14° C is optimum. Excessive silt loads (>4,000 mg/L) may halt Chinook salmon movements or migrations. Freshwater inflow into estuaries is critical for providing adequate water temperatures, food production, and overall beneficial environmental conditions for juvenile outmigration. Chinook salmon fry prefer protected estuarine habitats with lower salinity, moving from the edges of marshes during high tide to protected tidal channels and creeks during low tide. Juveniles forage in the intertidal and shallow subtidal areas of tidal marsh mudflat, slough, and channel habitats, and open bay habitats of eelgrass and shallow sand shoal areas. As the fish grow larger, they are increasingly found in high-salinity waters and less-protected habitats.

Habitat Areas of Particular Concern

Some activities will occur within areas designated as Habitat Areas of Particular Concern (HAPC) for various federally managed fish species within the Pacific Groundfish FMP. HAPCs are described in the regulations as subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPCs are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPCs are more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, the San Francisco Bay is designated as an estuary HAPC. No other HAPCs (e.g., eelgrass) occur in the Action Area.

Estuaries: Estuaries are protected nearshore areas such as bays, sounds, inlets, and river mouths, influenced by ocean and freshwater. Because of tidal cycles and freshwater discharge, salinity varies within, estuaries and results in great diversity, offering freshwater, brackish and marine habitats within close proximity. Estuaries tend to be shallow, protected, nutrient-rich, and biologically productive, providing important habitat for marine organisms, including groundfish. The inland extent of the estuary HAPC is defined as Mean Higher High Water (MHHW), or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow. The seaward extent is an imaginary line closing the mouth of a river, bay, or sound; and to the seaward limit of wetland emergent, shrubs, or trees occurring beyond the lines closing rivers, bays, or sounds. This HAPC also includes those estuary-influenced offshore areas of continuously diluted seawater, as defined by Cowardin et al. (1979).

2.4. Effects

2.4.1. General Habitat Impacts

The footprint of ground disturbance for the project is approximately 21,000 square feet, including a permanent footprint of approximately 5,100 square feet. The wall has been designed to avoid impacts to intertidal marsh, and clearing will be largely in areas with ruderal vegetation. There will be some vegetation planted on the waterside of the wall to provide habitat for wildlife.

2.4.2. Effects on California Ridgway's Rail

There is currently no habitat in the project area, so there will be no impacts to the California Ridgway's Rail. The nearest suitable habitat is located far from the project, 14 miles away at Eden Landing Ecological Preserve. Furthermore, the project is designed to avoid impacts to intertidal marsh, so will be out of the way of any foraging birds in the unlikely event that they are present.

2.4.3. Effects on San Francisco Garter Snake

There is no available habitat for the San Francisco garter snake, no presence of prey species, and no documented sightings in the project area. Therefore, the project will not have an impact on San Francisco garter snake.

2.4.4. Effects on CCC Steelhead and Critical Habitat

Although Colma Creek does not contain suitable habitat for steelhead spawning, but there may be individuals that use the tidal reaches for rearing or foraging. The wall alignment is entirely outside of tidal waters, but does cross a stormwater outfall that is inundated at high tide. As an avoidance and minimization measure, the construction contractor will be directed to isolate this area at low tide, when there is not sufficient water depth to support fish in that area. With this measure, the project is not likely to have adverse impacts on steelhead, but does have a small portion that intersects with critical habitat. Preventing discharges of untreated wastewater will avoid the adverse effects of not doing the project.

Figure 4. Stormwater outfall that crosses wall alignment and is inundated at high tide.

2.4.5. Effects on Southern DPS Green Sturgeon and Critical Habitat

Similar to the case for steelhead, Colma Creek does not contain suitable spawning habitat for green sturgeon. Because sturgeon are bottom feeders that feed on benthic macroinvertebrates, they have an even lower likelihood of being impacted by project construction. The avoidance and minimization measure mentioned above will also reduce the potential for impacting green sturgeon and their critical habitat.

2.4.6. Effects on Essential Fish Habitat

The potential adverse impacts for FMP-managed species and their EFH is similar to the steelhead and green sturgeon impacts described above. Because the wall alignment is entirely upslope of tidal waters, the potential for impacting EFH is minimal.

2.4.7. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions affecting listed species and their critical habitat that are reasonably certain to occur in the action area considered in this biological assessment.

Past and Present Actions

Based on the WQCP's past actions and community's current needs, this critical infrastructure will continue to operate as it has for the past several decades. The WQCP will soon finish its recent round of capital improvement projects and continue discharging treated wastewater to the Bay. Colma Creek itself is currently a degraded (in terms of habitat) flood control channel. The WQCP's primary outfall is located in relatively deep bay waters approximately 1 mile northeast of Point San Bruno. The WQCP will continue conducting fish toxicity testing under the requirements of their National Pollutant Discharge Elimination System permit to ensure that their discharge water is not acutely toxic to fish and other bay species. Clearing of the invasive *Spartina* from the area has removed endangered CA Ridgway's rail habitat, but as the native *Spartina* species returns, the rails may return as well.

Reasonably Foreseeable Future Actions

Implementing this project will allow the WQCP to continue operating safely well into the future as sea level rises. Other regional climate adaptation projects, likely under the direction of One Shoreline, will be implemented with a focus on providing community-oriented benefits like recreation and habitat restoration while still improving flood resiliency. While these projects are still not defined well enough to be incorporated into the future without project conditions, there is no inherent conflict between them and the TSP. With the combination of safe and resilient infrastructure (improved as a result of the TSP), habitat restoration and recreation improvements, it is anticipated that the overall quality of the human environment in this area will improve in the coming years, despite climate change and sea level rise.

2.5. Determination and Conclusion

We conclude that the project will have no effect on California Ridgway's rail or San Francisco garter snake, because of the lack of suitable habitat in the project area for either of these species.

We conclude that the project is not likely to adversely affect CCC steelhead, southern DPS green sturgeon, their critical habitats, and EFH and FMP-managed species, because of avoidance and minimization measures (including the moving the wall alignment to uplands) that reduce impacts to estuarine habitats.

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3. Consistency Determination

3.1. AUTHORITY

This Consistency Determination (CD) describes the US Army Corps of Engineers, San Francisco District's (USACE's) proposed coastal storm damage reduction project for Lower Colma Creek in South San Francisco. This CD is being submitted in accordance with the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. §1451 and the implementing regulations entitled Federal Consistency with Approved Coastal Management Programs, 15 C.F.R. Part 930. Under these regulations, USACE is responsible for managing its projects within the coastal zone jurisdiction in a manner that is consistent, to the maximum extent practicable, with the coastal zone management programs approved for California by the National Oceanic and Atmospheric Administration (NOAA). The program applicable to USACE projects in San Francisco Bay is the San Francisco Bay Plan (Bay Plan), which is administered by the San Francisco Bay Conservation and Development Commission (BCDC).

3.2. INTRODUCTION

The Lower Colma Creek Project in South San Francisco, California is a coastal storm damage reduction project at a wastewater treatment plant adjacent to the San Francisco International Airport (SFO). The South San Francisco/San Bruno Water Quality Control Plant, and North Bayside System Unit Facilities (also referred to as South San Francisco Water Quality Control Plant, or abbreviated as SSF WQCP) services an area with over 165,000 full time residents, plus the daily population of SFO airport (Figure 5). The USACE and the City of South San Francisco are cost sharing partners in this project.

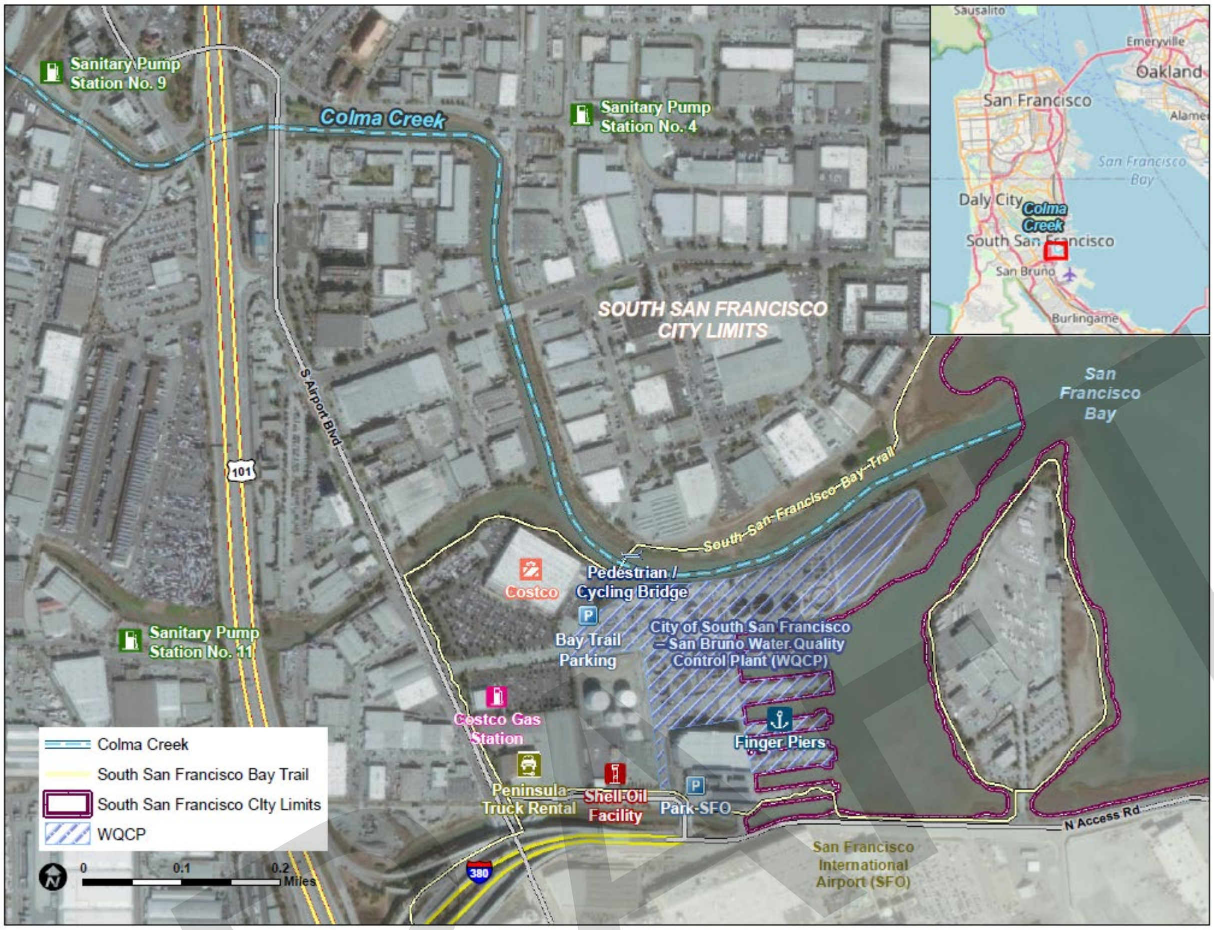

Figure 5. The South San Francisco Wastewater Quality Control Plant and nearest sanitary pump stations are located just north of San Francisco International Airport, along Colma Creek and San Francisco Bay.

3.3. DETERMINATION

The proposed Lower Colma Creek project entails building several floodwalls around the South San Francisco Water Quality Control Plant (SSF WQCP) to protect the wastewater treatment plant infrastructure from coastal storm damages and sea level rise. The permanent footprint of the floodwall will be 5,100 ft^2 total and the temporary construction footprint will be 16,500 ft^2 total. All of the Colma Creek project is within the jurisdiction of BCDC's 100 ft Shoreline Band (see Figure 6).

The USACE has evaluated the proposed Lower Colma Creek Project and has determined that it is consistent, to the maximum extent practicable, with the San Francisco Bay Plan Policies. A detailed project description and an assessment of this project's consistency with those policies are provided below.

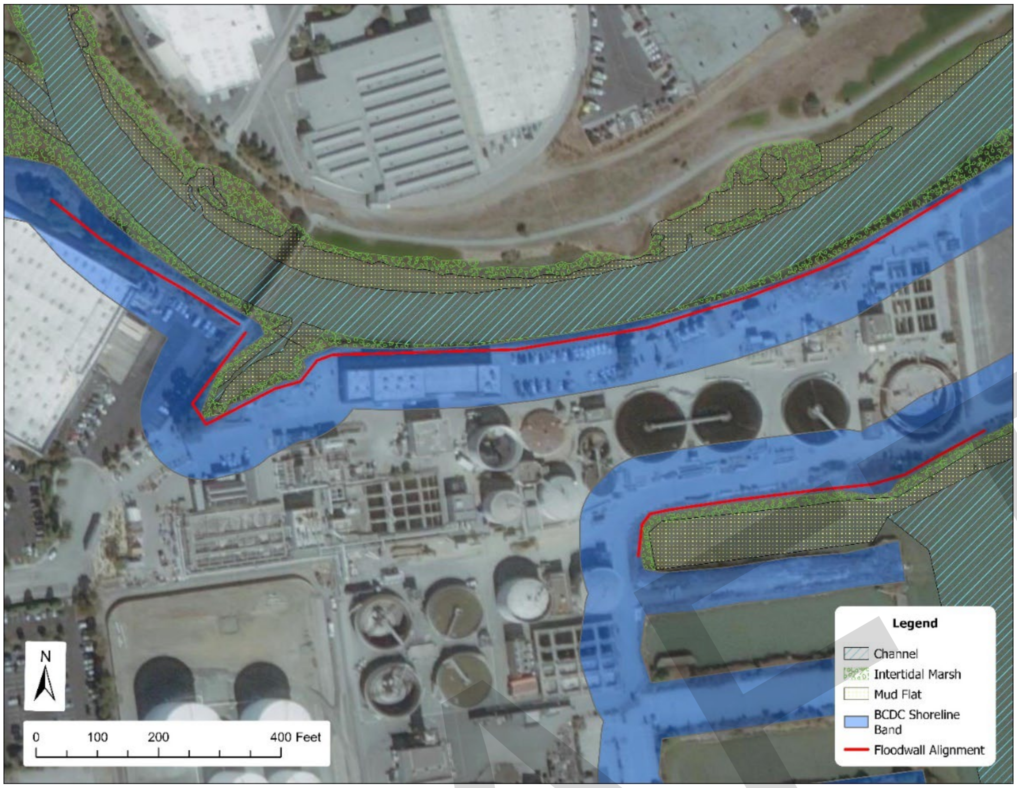

Figure 6. BCDC Shoreline Band and Wetlands and Waters of the U.S. in the vicinity of the study area.

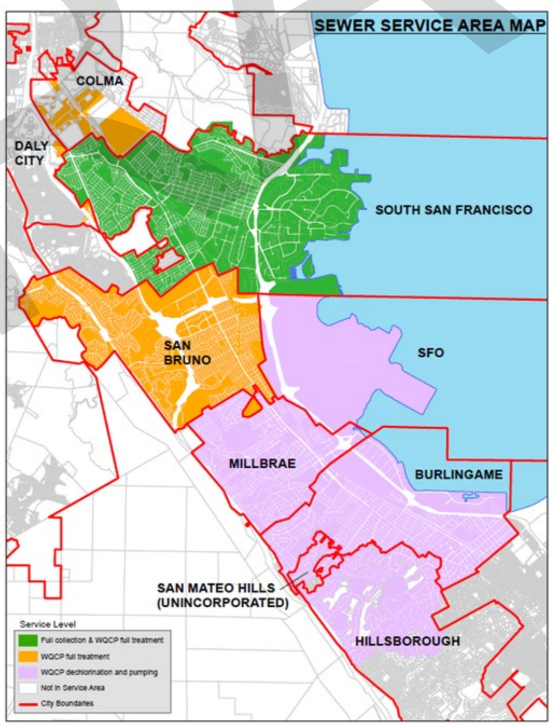

Figure 7. Service area by treatment/service type of the South San Francisco Wastewater Quality Control Plant.

3.3.1. Project Location and Existing Conditions

The SSF WQCP is located in the City of South San Francisco, CA (SSF), which is part of San Mateo County. South San Francisco is bordered by the cities of Brisbane to the north and San Bruno to the south (Figure 7). Project Assessor's Parcel Numbers (APNs) are shown in Table 1 and Figure 8. The approximate coordinates of the project center point are 37.64093 N, 122.39398 W.

Table 1. Project Assessor's Parcel Numbers (APNs) for the project area.

Area	Owner	Project Assessor's Parcel Number
WQCP Floodwalls	City of South San Francisco (CSSF)	015-180-180
WQCP Floodwalls	City of South San Francisco (CSSF)	015-180-260
WQCP Floodwalls	State of California (ST of CALIF)	096-070-040
Pump Station 4	City of South San Francisco (CSSF)	015-135-200

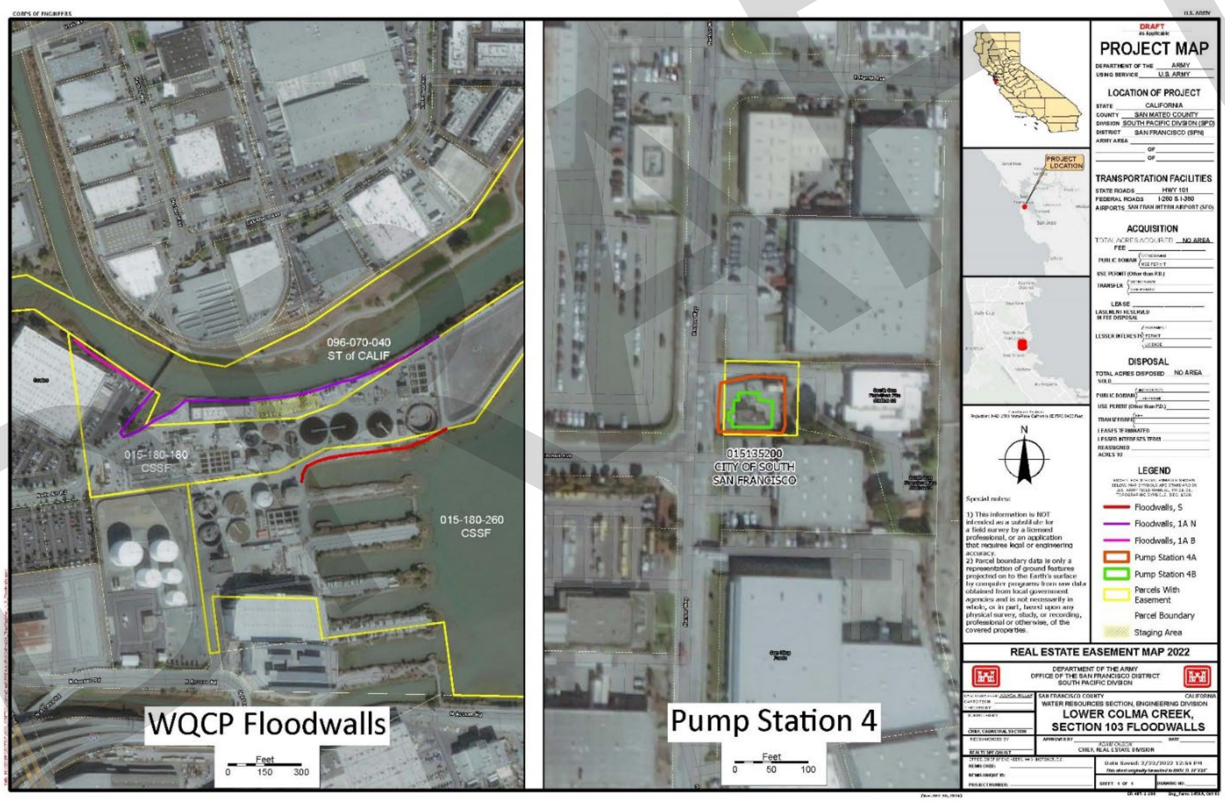

Figure 8. Real estate map.

Colma Creek drains roughly 16 square miles as it flows from San Bruno Mountain down through the heavily urbanized cities of Colma, South San Francisco, San Bruno, and Daly City on its way to San Francisco Bay (Figure 5). The creek is bordered by the San Andreas Fault to the west and San Bruno Mountain to the north. As it approaches San Francisco Bay, the Colma Creek channel once included historical salt marsh wetlands, most of which have been filled due to development. Limited wetland areas remain at the mouth of Colma Creek. Today, the creek serves as the City's stormwater infrastructure. Location and vicinity maps with modern and historical Baylands are shown below (Figure 9).

The cost for the study, permitting, design, and construction for this project is approximately $10,100,000. The estimated duration of the construction for the floodwall and utility modification is 1 year. Construction at the earliest would be anticipated in 2024. The construction disturbances will be within an 8ft wide strip (4ft on either side of the wall). Where this strip intersects with the marsh, the contractor will be instructed to avoid disturbing the marsh. The construction equipment will move along the plant side of the wall driving the sheet piles. The construction will occur adjacent to the marsh, but not within it. The contractor will use BMPs like silt fencing to maintain separation between their work and the marsh. There will not be any work done in the Colma Creek channel itself. Updates to this schedule and cost information will be provided as appropriate.

Table 2. Project footprint in the shoreline band.

Elements of Project	Shoreline band (ft^2)
Shoreline Protection (Flood Wall)	5,100
Temporary Construction Zone	16,500
Totals:	21,600

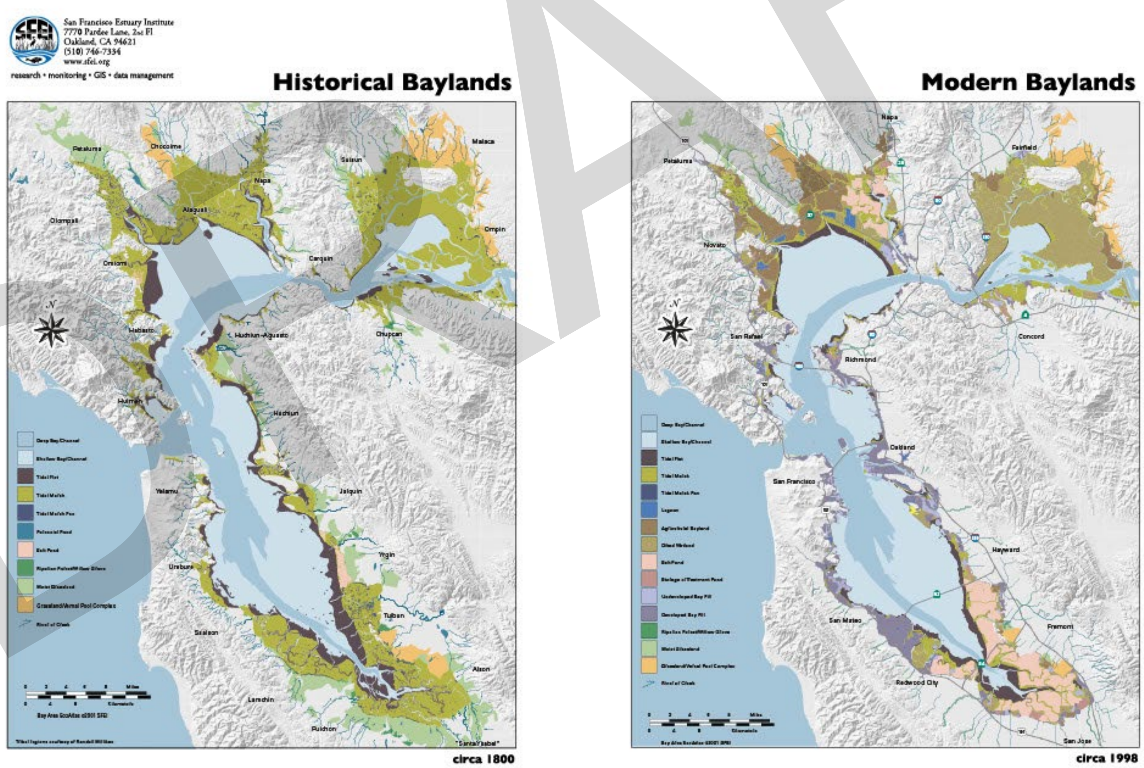

Figure 9. Historical and present San Francisco Baylands. Map courtesy of the San Francisco Estuary Institute.

3.3.2. Construction Description

The North Floodwall will include a 2,000 foot long I-wall (sheetpile) floodwall, approximately 3 to 4.5 feet above grade at the north side of the WQCP adjacent to the right-bank of Colma Creek. The South Floodwall will be 700 feet long and approximately two feet high south of the WQCP adjacent to San Francisco Bay. The sheetpile flood walls will be topped with a concrete cap. The footprint of disturbance will be limited to four feet on either side of the wall centerline. A perimeter sheetpile floodwall, approximately 2 feet above grade, will be constructed at Pump Station 4, which is located outside the CZMA.

This floodwall meets the CSRM objectives of managing risk to human life and safety by managing the risk of the WQCP and Pump Station 4 flooding, up to an extreme tide elevation of 12.3 ft during a 0.2% AEP event with 50 years at the Intermediate SLR rate from the base year of 2023, with a wall crest elevation of 13.5 ft. This prevents flooding through the low spots on the north side from the Colma Creek channel and through the low spots on the south side of the WQCP area. The WQCP is still susceptible to overland flow from the west, but this flooding was found to enter the WQCP area only at extreme tide elevations greater than 13 ft. This would allow plant operators to keep the plant operational and avoid emergency releases of raw sewage into Colma Creek and San Francisco Bay due to plant shutdowns. It would also manage the risk of coastal flooding causing raw sewage to back up into homes and streets if pump stations were to fail or the plant were to not be able to accept pumped sewage. The building of this floodwall will reduce economic damages that could occur annually by $774,843 and has annual net benefits of $340,612 and a benefit to cost ratio of 1.78. It improves resiliency to sea level rise for the project area region. The likely recommended plan also improves social justice by managing risk of impacts to human health and safety, as well as aesthetic impacts of raw sewage in socially disadvantaged communities. According to the BCDC community vulnerability database referenced in Section 2.12 of the DPR/EA, there are at least 15,000 people in the high and highest social vulnerability categories who live within a mile of the WQCP and pump station 4.

The building of this floodwall is relatively straightforward and simple to implement, with the majority of construction and staging occurring on WQCP property, limited excavation required, and low and mitigatable impacts to habitat and cultural resources. The floodwall is vulnerable to 0.2% AEP events with 20-50 years at the Intermediate SLR rate from the base year of 2023. The floodwall is vulnerable to 0.2% AEP events with 50 years at the High SLR rate. In this sense, this project reduces the risk of needing future adaptation based on higher rates of future SLR. Because the additional cost for this added resiliency is not very high, the net benefits from the project increase with this added increment.

3.3.3. Existing Conditions

As the study area is located on the shoreline of San Francisco Bay, there is a considerable amount of jurisdictional wetlands and Waters of the U.S. nearby. The channels and mudflats are "other Waters of the U.S." and wetlands are "intertidal marsh". To determine the extents of these jurisdictional waters and wetlands, the team used a combination of previously conducted delineations, satellite imagery, and in-situ measurements.

The WQCP is located on the shoreline of San Francisco Bay, just north of SFO Airport and south of Colma Creek. The project site lies on a peninsula with protected inlets of San Francisco Bay to the east and south. The WQCP site consists entirely of previously developed or landscaped areas with mostly industrial land use in the vicinity such as petroleum storage, warehousing, shipping and light manufacturing (BCDC, 1998).

3.3.4. Flood Risk

Periodic flooding occurs in South San Francisco but is generally confined to certain areas along Colma Creek north of the project site. The water levels in Colma Creek are highly influenced by both tidal action and storm events. The project site is located within a 1% annual exceedance probability (AEP) floodplain, colloquially referred to as the 100-year floodplain, designated by the Federal Emergency Management Agency (FEMA; 2012). The FEMA maps reviewed in a recent flood study (Carollo Engineers, 2010) indicate that the 1% AEP event occurring at high tide would raise water levels to 9.7 feet above mean sea level. The Maintenance Building at the project site lies at an elevation of approximately 12.82 feet (Carollo Engineers, 2010). While the water level is not regularly monitored in the stretch of the creek bordering the project site, near- flooding conditions have been observed outside the Maintenance Building (Carollo Engineers, 2010). As recently as October 13, 2009, the water level was measured to be 1.6 feet above the 1% AEP flood level (11.3 feet above mean sea level), which is approximately 1.5 feet below the Maintenance Building's foundation elevation. The project site is not substantially higher than potential flooding events. The proposed project does not include any residential components and the proposed improvements would not likely be significantly damaged in the event that flooding occurs.

Much of the existing electrical and pumping infrastructure for the WQCP is located in subterranean facilities that are vulnerable to flood water. Relocating, or raising this infrastructure is very costly and not always feasible, given the interconnected nature of the facilities which pipe and pump effluent between various treatment tanks, often using gravity to move wastewater. The main discharge pipe from force main station 4 runs directly under Colma Creek, adjacent to the plant.

3.3.5. Consistency with Bay Plan Policies

An analysis of the applicable and enforceable Bay Plan policies as they relate to this phase of the project is included below. The policy analysis below has been updated to refer specifically to the Lower Colma Creek project. The proposed project does not involve any areas of shell deposits, freshwater inflow, or subtidal areas, therefore these policies are not applicable. Policies concerning dredging, water-related industry, ports, airports, salt ponds, managed wetlands, and fills in accord with the bay are not applicable since the proposed project area does not include any of these facilities or operations. Non-applicable policies are followed by (N/A).

Fish, Other Aquatic Organisms, and Wildlife

The Colma Creek project is consistent with Bay Plan policies related to fish, other aquatic organisms, and wildlife. There is no in-water work associated with this action. Colma Creek supports several aquatic resources but is not directly part of the project area. The California Ridgway's rail (*Rallus longirostris obsoletus*) and the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) are two endangered species that have been recorded near the project area. Survey results from the 2012 Invasive Spartina Project (ISP) and recent surveys from 2018 confirm no recent observances of the California Ridgway's rails in or adjacent to the project area (Olofson Environmental 2012, BioMAaS 2018). The last observance of a California Ridgway's rail was in 2011 at the navigable slough northwest of the project area. The San Francisco garter snake is found on the San Francisco peninsula in San Mateo and Santa Cruz counties. The species inhabits marshlands that border ponds and sloughs, riparian cover along streams, and bordering meadows with scattered brush. Suitable habitat is not available in the project area. USACE is consulting with the National Marine Fisheries Service (NMFS) on the project, in accordance with Section 7(a)(2) of the Endangered Species Act (ESA;16 U.S. Code 1536[c]) and Section 305(b) the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA; Public Law 104-297). The USACE will consider any recommendations and ensure compliance with any requirements from these agencies that are applicable to the Lower Colma Creek project to avoid potential adverse effects on special status species and their habitats.

This project has an impact area of approximately 21,500 ft^2 (0.5 acres). The vast majority of this is in ruderal grassland. The wall alignment has been shifted to minimize impacts to marsh species. The vegetation within 4 feet of either side of the wall alignment will be cleared prior to construction. To minimize impacts to biological resources, the project will include the following avoidance and minimization measures. Prior to construction, the project area will be surveyed by a qualified biologist for nesting birds. If active nests are found, the biologist will set up a 50 ft buffer until the nests are no longer active. If the nesting bird is a raptor, the biologist will set up a 250 ft buffer until the nest is no longer active.

The waters of the Bay adjacent to the project are critical habitat for the threatened Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) and the threatened Southern Distinct Population Segment (DPS) of green sturgeon (*Acipenser medirostris*). The project will not occur directly in the bay.

Water Quality

The Lower Colma Creek project will protect Colma Creek and the adjacent Bay from discharges of untreated effluent and avoid water quality degradation and associated impacts to human health and the environment. The WQCP services an area with over 165,000 full time residents, plus the daily population of SFO airport (Figure 7). According to the BCDC community vulnerability database, there are at least 15,000 people in the high and highest social vulnerability categories who live within a mile of the WQCP and pump station 4. Releases of untreated wastewater associated with a flooded WQCP would have significant negative impacts on the water quality of Colma Creek, the San Francisco Bay, and these vulnerable communities. This project helps protect freshwater inflow into the Bay from Colma Creek.

Best Management Practices (BMPs) will be implemented during construction to address erosion and sediment control as work will be performed adjacent to the Bay. The construction contractor will be required to get a Construction General Permit and implement a Stormwater Pollution Prevention Plan. If project plans changed and work was required below the ordinary high watermark or within wetlands, then applicable permitting and analysis would be completed prior to construction. BMPs would be implemented to ensure the protection of water quality and prevent the discharge of pollutants throughout the Lower Colma Creek project to ensure no sediment, storm water, debris, rubbish, cement, concrete or concrete washings, oil or petroleum products, or other organic or earthen material from construction or associated activities enter the Bay. Other BMPs would include use of dedicated areas for fueling equipment and performing other maintenance, avoidance of overtopping equipment gas tanks, proper containment of fluids and gases, proper disposal of debris from site and submittal of an Environmental Protection Plan prior to start of work.

Impacts to wetlands associated with flood control measures were evaluated for compliance with Section 404 of the Clean Water Act administered by USACE. The boundary of jurisdictional waters was used to avoid impacts, and therefore a 404(b)(1) evaluation has not been prepared. Section 401 Water Quality Certification is granted in the project area by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), but if there is no 404 discharge of fill, a 401 certification is not required. Significant impacts to water quality are not anticipated given that the project is not occurring directly in the water. This project is consistent to the maximum extent practicable with all Water Quality Bay policies.

Water Surface Area and Volume

N/A

Tidal Marshes and Tidal Flats

The surrounding areas of the WQCP were originally a mudflats and tidal marsh environment with a small hill situated at the center known as Belle Air Island (Figure 10). Adjacent and surrounding the WQCP today are portions of salt marsh within Lower Colma Creek, the San Bruno Slough and Canal, and San Francisco Bay shoreline. The project was designed to avoid impacts to the tidal marsh as much as practicable. This project will not decrease square footage of the marsh. The proposed floodwall in the Colma Creek project will protect the WQCP from sea level rise and directly provides infrastructure for sea level rise adaption. This project is consistent to the maximum extent practicable with all Tidal Marsh and Tidal Flats policies.

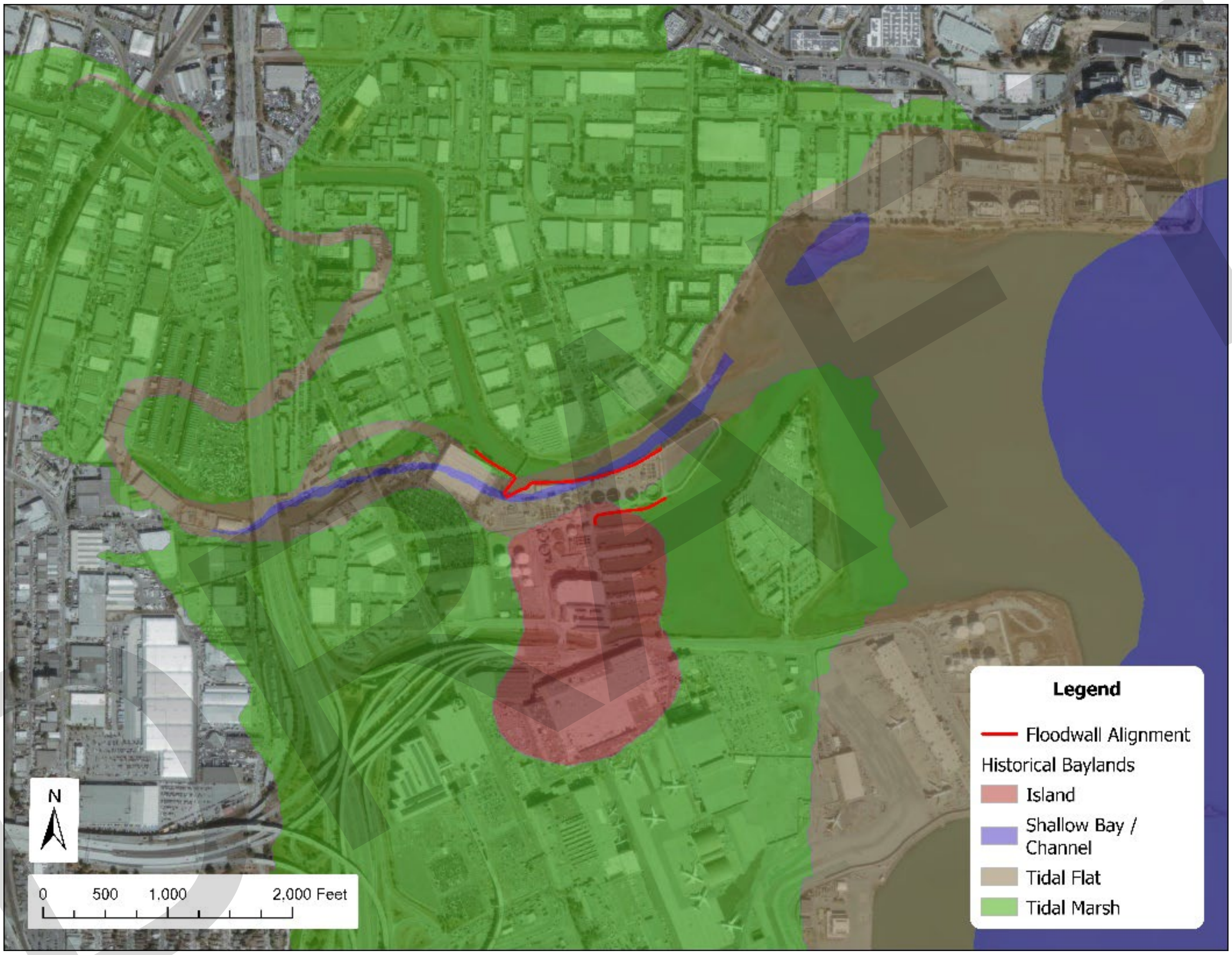

Figure 10. Historical tidal marsh overlaid with the floodwall alignment.

Smog and Weather

As stated under the Water Quality policy above, the proposed Lower Colma Creek project would not result in fill in the Bay. This extremely minor reduction in surface area of the Bay as a result of this project is not expected to affect the Bay's function as an environmental regulator of particulate and smog within the atmosphere of the Bay Area. This function would be maintained in compliance with the Bay Plan policy related to Smog and Weather. In addition, proper BMPs relating to minimizing idling of equipment and vehicles onsite will be implemented throughout the construction process to avoid air quality impacts. Based on this process for the emissions inventory and air quality analysis, it was determined that the emissions associated with the selected project alternative are below applicable Federal and Bay Area Air Quality Management District thresholds, and thus, the project would not cause an impact to air quality. This project is consistent to the maximum extent practicable with all Smog and Weather Bay policies.

Shell Deposits
N/A

Freshwater Inflow
N/A

Subtidal Areas
N/A

Environmental Justice and Social Equity
The proposed Lower Colma Creek Project would take place in South San Francisco, California along the shoreline of the San Francisco Bay. According to the BCDC community vulnerability mapper, the existing Lower Colma Creek Project falls in a census block group with moderate social vulnerability. Based on the BCDC contamination vulnerability mapper, there are census block groups with mapped high contamination vulnerability in or around the Lower Colma Creek Project. According to the BCDC community vulnerability database, there are at least 15,000 people in the high and highest social vulnerability categories who live within a mile of the WQCP and pump station 4. The selected project plan includes benefits/damages and avoids impacts to vulnerable populations as the project is protecting the wastewater treatment plant. This would not add to contamination, it would project communities from contamination. Some temporary increase to emissions would occur during construction but would not adversely affect the local community. Public outreach was conducted on March 4th, 2022 when USACE met with the Colma Creek Advisory Committee for a publicly held meeting and there will be more public outreach in the future. A public meeting is scheduled for June 2022 and community organizations will be invited to attend. This project is consistent to the maximum extent practicable with all Environmental Justice and Social Equity Bay policies.

Climate Change
The proposed wall will protect the South San Francisco Water Quality Control Plant (SSF WQCP) from future sea level rise. By providing protection against sea level rise and flooding from Colma Creek this project is providing protection to this critical infrastructure. The floodwall is vulnerable to 0.2% AEP events with 20-50 years at the Intermediate SLR rate from the base year of 2023. The floodwall is vulnerable to 0.2% AEP events with 50 years at the High SLR rate. In this sense, this project reduces the risk of needing future adaptation based on higher rates of future SLR. The SLR is based on USACE guidance and tools laid out in ER 1100-2-8162, which uses climate change projections from the Intergovernmental Panel on Climate Change and the National Research Council. After the floodwall is installed, the SSF WQCP is expected to be resilient to a mid-century sea level rise projection and likely beyond.

The proposed project will not negatively impact the Bay and will decrease risks to public safety through ensuring continued functioning of the SSF WQCP. This project is consistent to the maximum extent practicable with all Climate Change Bay policies.

Safety of Fills
Safety of fills does not apply, because the fill is not occurring directly in the Bay. The floodwall is categorized as fill in the 100 ft shoreline band and the WQCP is built on artificial fill. This project is not filling directly in the Bay, it is fill in the 100 ft shoreline band.

Shoreline Protection

This project is necessary to provide flood protection for the SSF WQCP which is existing critical infrastructure. This project will help mitigate contamination by reducing the risk that sewage will spill into nearby waters during a flood event. The protective structure used for this project is appropriate for the project site and the project is properly engineered to provide flood protection for a 100-year flood event with SLR incorporated as described above. The project team investigated opportunities to incorporate natural and nature-based features into alternative designs. However, upon further investigation the opportunities proved limited within the constraints of this study. The project areas where natural and nature-based solutions could be implemented already have a concrete revetment or marsh in front of them so there would not be any additional need or benefit from adding these features to the project area. The areas where natural and nature-based solutions could be applied do not have flood risk. Due to security concerns, public access is not allowed on the facility grounds, including access to the shoreline. This project is consistent to the maximum extent practicable with all Shoreline Protection Bay policies.

Dredging

N/A

Water-Related Industry

N/A

Ports

N/A

Airports

N/A

Transportation

No new transportation related fill or bridges within or across the Bay are proposed as part of the Colma Creek project, therefore, these policies are not applicable.

Commercial Fishing

N/A

Recreation

This area is not suitable for recreation due to the safety concerns and for not providing an aesthetic experience due to smells emanating from the WQCP. The WQCP is not open for public access. The policies within the Bay Plan that address projects relating directly to activities of recreation do not apply. Parking and recreation in adjoining areas is not expected to be affected by the project. Minor increases in noise levels associated with the short-term operation of demolition and construction equipment during the proposed Colma Creek project could temporarily lower the quality of recreation around the action area. Noise mitigation will be done when practicable, for example a vibratory instead of a hydraulic hammer will be used to reduce noise levels. This project is consistent to the maximum extent practicable with all Recreation Bay policies.

Public Access

While a Bay Trail alignment has been shown on plant property in Bay Trail planning documents, past discussions between USACE, BCDC, and the City of South San Francisco have determined this to be not feasible because of security and safety concerns. Rerouting the SF Bay Trail to go around the WQCP along the creek and bayside would pose an unacceptable public safety risk of exposure to deadly airborne chemicals in the event of an accident. There is not sufficient space for a 12 foot wide paved trail and the cost is likely to exceed allowable thresholds for recreation within this project's financial limits. Finally, rerouting the Bay Trail along the WQCP is likely to degrade the olfactory experience of trail users, and may not be considered an aesthetic improvement by trail users for this reason.

The Colma Creek project would not involve the creation of new public access infrastructure, would not result in changes to any public access as the WQCP is on SF Municipal property that is not open to public access, and would be executed in a way that maintains maximum feasible public access to the nearby Bay Trail during construction. This project was designed to avoid impacts to the Bay Trail as much as possible. During construction, the Bay Trail will be closed at times when work is occurring immediately adjacent to the trail alignment, but access to the nearby pedestrian bridge will be maintained. This project is consistent to the maximum extent practicable with all Public Access policies.

Appearance, Design, and Scenic Views

The wall will be built with functionality at the forefront. However, there will be some aesthetic impacts associated with the 3 to 4.5 ft tall wall along the project alignment. The study area is already developed and industrialized, therefore the overall nature of the viewshed would not change. There are vista points around the WQCP and these will be minimally effected by the building of this wall. All construction work will be conducted beginning in 2024. Entry onto the WQCP property will be through a private gate, avoiding public access areas mentioned above to the maximum extent possible. All hauling of materials and equipment that crosses public access, if any, will be minor and temporary and would be executed with measures to protect public safety including construction flaggers if necessary. This project is consistent to the maximum extent practicable with all Appearance, Design, and Scenic Views Bay policies.

Salt Ponds

N/A

Managed Wetlands

N/A

Other Uses of the Bay and Shoreline

The WQCP does not interfere with and is incompatible with residential, recreational, or other public uses of the Bay and shoreline. The proposed project would not involve any other uses of the Bay and shoreline as described in the Bay Plan; therefore, such policies are not applicable. This project is consistent to the maximum extent practicable with all Other Uses of the Bay and Shoreline Bay policies.

Fills in Accord with the Bay Plan

N/A

Mitigation

To the maximum extent practicable, the Colma Creek project has been designed to avoid or minimize adverse environmental impacts to the San Francisco Bay in accordance with Bay Plan policies. There would be no significant effects resulting from this action that are expected to result in adverse environmental impacts. A minor increase in fill with only 5,100 ft^2 is the minimum fill necessary to build and ensure the future structural and seismic safety of the structure. There will be a community meeting in June 2022. This project is consistent to the maximum extent practicable with all Mitigation Bay policies.

Public Trust

The Colma Creek project would involve lands within the San Francisco Bay that are subject to the public trust. Because this project provides flood protection to the surrounding area, this project would preserve open space on these public trust lands and protect it from SLR. This project is consistent to the maximum extent practicable with all Public Trust Bay policies.

Navigational Safety and Oil Spill Prevention

N/A

4. Air Quality Analysis

Emissions Inventory and Air Quality Analysis: Preferred Alternative- All Equipment Combined

Emissions Inventory

Emission Source Data					Pollutant Emission Factors for Specific Construction Equipment (lbs/hr) or (lbs/mile)[1,2,3]						Daily Equipment Emissions from Construction Activities (lbs/day)					
Construction Activity/Equipment Type	**Power Rating (Hp)**	**# Active**	**Hourly Hp-Hrs**	**Hrs per Day Or Miles Per Day [(1)]**	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Worker vehicles	N/A	5	NA	40	0.00048658	0.00397866	0.00035150	0.00001072	0.00009661	0.00006389	0.097	0.796	0.070	0.002	0.019	0.013
Water Truck	N/A	1	NA	15	0.00090210	0.00457902	0.01031407	0.00004009	0.00052122	0.00039592	0.014	0.069	0.155	0.001	0.008	0.006
Dump Trucks (10 CY)	400	10	NA	8	0.00919793	0.03139379	0.05812359	0.00009674	0.00217069	0.00193192	0.736	2.512	4.650	0.008	0.174	0.155
Excavator	120	2	NA	8	0.04483418	0.49421220	0.26376217	0.00086364	0.00922464	0.00820993	0.717	7.907	4.220	0.014	0.148	0.131
Concrete/Industrial Saws	30	1	NA	8	0.03367338	0.37057343	0.24708163	0.00069733	0.00931589	0.00829114	0.269	2.965	1.977	0.006	0.075	0.066
Rubber Tired Loaders	120	1	NA	8	0.03971933	0.39159132	0.24763471	0.00069109	0.01146721	0.01020582	0.318	3.133	1.981	0.006	0.092	0.082
Dump Truck	NA	1	NA	40	0.00090210	0.00457902	0.01031407	0.00004009	0.00052122	0.00039592	0.036	0.183	0.413	0.002	0.021	0.016
Water Truck	NA	1	NA	40	0.00090210	0.00457902	0.01031407	0.00004009	0.00052122	0.00039592	0.036	0.183	0.413	0.002	0.021	0.016
Roller	120	2	NA	8	0.03922055	0.38010541	0.26471585	0.00069197	0.01367858	0.01217394	0.628	6.082	4.235	0.011	0.219	0.195

Air Quality Analysis

	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Daily Emissions (lbs/day)	2.85	23.83	18.11	0.05	0.78	0.68
BAAQMD Thresholds of Significance (Construction)(lbs/day)	54	None	54	None	82	54
Project Emissions Exceed BAAQMD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Total Project Emissions (Tons)	0.214	1.787	1.359	0.004	0.058	0.051
EPA NAAQS Yearly Significance Thresholds (Tons)	100	100	100	100	100	100
Project Emissions Exceed Federal Yearly Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

$Equipment\ Emissions = \#Active * Emission\ Factor * Time\ (hours)$

Where:
Equipment emissions = portion of emissions for each pollutant in pounds per day
 # Active = the number of machines in use for each type
Emission Factor = fraction of each pound of emissions for each pollutant
Time = daily operating time (hours)
EngineHP = Engine brake horsepower rating

References
1. SCAQMD 2021a
2. SCAQMD 2021b
3. SCAQMD 2021c.

Green House Gases Emissions Inventory and Analysis

GHG Emissions Inventory

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]				Daily GHG Emissions from Construction Activities (lbs/day)				
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day [1]	CO	CO_2	CH_4	NOx	CO	CO_2	CH_4	NO_X	CO_{2eq}
Worker vehicles	N/A	NA	5	NA	40	0.00397866	1.11019931	0.00004121	0.00035150	0.796	222.040	0.008	0.070	243.991
Water Truck	N/A	NA	1	NA	2.8	0.00457902	4.21483461	0.00004176	0.01031407	0.013	11.802	0.000	0.029	20.423
Dump Trucks (10 CY)	400	NA	10	NA	8	0.03139379	7.62439642	0.00082991	0.05812359	2.512	609.952	0.066	4.650	1999.789
Excavator	120	NA	2	NA	8	0.49421220	73.62306780	0.00404531	0.26376217	7.907	1177.969	0.065	4.220	2445.113
Concrete/Industrial Saws	30	NA	1	NA	8	0.37057343	58.46365276	0.00303830	0.24708163	2.965	467.709	0.024	1.977	1060.324
Rubber Tired Loaders	120	NA	1	NA	8	0.39159132	58.91350855	0.00358381	0.24763471	3.133	471.308	0.029	1.981	1065.519
Dump Truck	400	NA	1	NA	40	0.00457902	4.21483461	0.00004176	0.01031407	0.183	168.593	0.002	0.413	291.762
Water Truck	400	NA	1	NA	40	0.00457902	4.21483461	0.00004176	0.01031407	0.183	168.593	0.002	0.413	291.762
Roller	120	NA	2	NA	8	0.38010541	58.98875264	0.00353881	0.26471585	6.082	943.820	0.057	4.235	2213.482

CO2eq = CO2 + X*CO + Y*NOx + Z*CH4
Where X = 100 Year Global Warming Potential for Carbon Monoxide = 1
Where Y = 100 Year Global Warming Potential for Oxides of Nitrogen = 298
Where Z = 100 Year Global Warming Potential for Methane = 25
CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

GHG Analysis

Total CO2eq (lbs/day)	9632.1654
BAAQMD Daily GHG (CO2eq) Threshold	None
Project Exceeds BAAQMD Daily GHG Threshold?	**No**
Total Project CO2eq (Tons)	722.4124
Council on Environmental Quality Yearly GHG Threshold (CO2eq) (Tons)	None
Project Exceeds Council on Environmental Quality Yearly GHG Threshold?	**No**

5. Fish and Wildlife Coordination Act Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay Delta Fish and Wildlife Office
650 Capitol Mall 8th floor 8-300
Sacramento, California 95814

In Reply Refer to:
2022-0020179

Tessa Beach, Ph.D.
Chief, Environmental Branch
U.S. Army Corps of Engineers
San Francisco District
450 Golden Gate Ave 4th Floor
San Francisco, California 94102-3404

Dear Dr. Beach:

Please find enclosed our Fish and Wildlife Coordination Act report for the U.S. Army Corps of Engineers' proposed Lower Colma Creek Section 103 CAP Study.

If you have any questions on this report, please contact Steven Schoenberg of my staff at (916) 930-5672, or at Steven_Schoenberg@fws.gov.

Sincerely,

Donald Ratcliff
Field Supervisor

Enclosure

cc:
Jeneya Fertel, Corps of Engineers, San Francisco, California
Tessa Beach, Corps of Engineers, San Francisco, California
Brian Meux, NOAA Fisheries, Santa Rosa, California
Anniken Lydon, BCDC, San Francisco, California
Tahsa Sturgis, RWQCB, Oakland, Californias
Brian Schumacker, South San Francisco Water Quality Control Plant, San Francisco California

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE COORDINATION ACT REPORT FOR THE LOWER COLMA CREEK SECTION 103 CAP STUDY

PREPARED BY:

Steven Schoenberg, Senior Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
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Sacramento, California

PREPARED FOR:

U.S. Army Corps of Engineers
San Francisco District
San Francisco, California

April 2022

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FIGURES

SUMMARY

The Corps of Engineers' preferred action alternative for the Lower Colma Creek Section 103 CAP Study involves constructing floodwalls to protect the South San Francisco Water Quality Control Plant and Pump Station 4 from damage from coastal flooding up to the 500 year event with intermediate projected sea level rise. A combination of already developed land, as well as a modest area of upland herbs, some dense shrubs, and a few trees, would be impacted by the project. The project would greatly reduce the risk of flooding of this critical infrastructure, interruption of and damage to wastewater conveyance and treatment facilities, and environmental damage from discharge of raw sewage into tidal waters with sensitive marsh and mudflat habitats. To avoid this risk and impact, the U. S. Fish and Wildlife Service recommends that the project be constructed as proposed.

INTRODUCTION

This document represents the United States Fish and Wildlife Service's (Service) Fish and Wildlife Coordination Act (FWCA) report on the U.S. Army Corps of Engineers' (Corps) Lower Colma Creek Section 103 CAP (Continuing Authorities Program) Study project (project). The project proposes flood control improvements to the South San Francisco-San Bruno Water Quality Control Plant (WQCP) and Pump Station 4 (PS4). The WQCP receives sewage from about 120,000 residents of South San Francisco and performs dechlorination of treated effluent from other communities including the San Francisco Airport. Over the long term, these facilities are at risk of damage and outage due to flooding from coastal storm events, especially with anticipated sea level rise. Flooding would not only cause a loss of treatment services to the human population, but poses environmental risks associated with the backing up of sewage into homes, streets, and subsequent release into Colma Creek and San Francisco Bay (Bay).

The WQCP is located on Belle Air Road on a small peninsula at the mouth of Colma Creek just east of a Costco retail store in the community of South San Francisco. The site is on about 21 acres of completely developed land consisting of buildings, storage/treatment tanks, electrical, chemical, and conduit facilities, paved roads and parking, and a lined pond on the easternmost portion, which is the only element of the facility with a levee around it. There is no flood protection elsewhere other than the surface height of the facility, which is about 11 feet above mean sea level. PS4 consists of pumps and sewage grinders in a single story building with a few exterior electrical boxes and cranes on Harbor Way, about ~0.5 mile north of the WQCP. This pump station collects and conveys sewage from several smaller pump stations in the area to the WQCP for treatment through a force main. It is approximately 400 feet from the north bank of Colma Creek, which has an existing floodwall in this location, but it is of insufficient height to protect PS4 from flooding over the long term.

Coordination activities under FWCA began in 2021 and consisted of calls with the Corps, one on January 10, 2022, which included other resource and regulatory agencies, and a site visit on November 4, 2021, by the Service and Corps only. Information considered in this report includes discussion during these activities, descriptive information and related reports provided by the Corps via email, other publicly available information on the facilities, and our observations during the site visit.

PROJECT DESCRIPTION

Only the preferred action alternative is described in this report. The Corps investigated several others alternatives, but they were screened out because they were found to be less effective or cost prohibitive. The project consists of constructing sections of floodwall at the WQCP and perimeter of PS4 to an elevation of 13.5 feet NAVD88 (Figures 1, 2). This elevation corresponds to the 0.2% annual chance exceedance event after 50 years of sea level rise with the Corps' intermediate sea level rise curve. The estimated duration to complete the proposed work is one year.

At the WQCP, the south and north sections of new floodwall will be 670 and 2,000 feet long, respectively. Within a 4-foot-wide zone along the alignment of each floodwall section, surface vegetation, rock, and/or concrete would be removed, sheetpile would be driven into the surface, and the completed floodwall covered with an 18-inch-wide concrete cap. There is a pedestrian/bicycle bridge over Colma Creek at the west side of the site which is part of the Bay Trail. Just east of this bridge, the floodwall will be sited inland as much as possible to avoid existing marsh vegetation and allow a zone for the marsh to migrate as sea level rises. There is a low spot west of the bridge between the WQCP and a Costco retail store. The slope toe would be excavated and imported clay placed to fill this location prior to constructing the floodwall. The staging area will be somewhere on paved ground, either the area shown in Figure 1 (a parking lot), or some other paved surface nearby.

At PS4, the paved surface would be cut, and concrete slabs and excess soil removed along the alignment of 325 feet of perimeter (Figure 2). A 2-foot-high concrete floodwall would be installed with a 30-foot-wide entrance that can be sealed with stoplogs during flooding.

Excess materials (rock, concrete, and/or soil), would be removed from both work locations and disposed at a landfill. Any soil surfaces would be hydroseeded, and further measures may be needed depending on the final slope, such as erosion control netting/blanket or wire netting.

Figure 1. Proposed work at Water Quality Control Plant.

Figure 2. Proposed work at Pump Station 4.

BIOLOGICAL RESOURCES

The project location is situated at the interface between the developed urban lands of South San Francisco and remnant natural habitats at the mouth of Colma Creek where it meets the Bay. The primary natural habitats are tidal channel, vegetated (high) marsh, unvegetated mudflat at lower elevations, upland (herbaceous and shrubs) at higher elevations, and open bay waters beyond. Just east of the trail bridge, there is a small embayment that has significant growth of pickleweed (*Salicornia virginica*). Farther east along the alignment of the north floodwall, the slope of the creek is armored for at least half of its length with articulated concrete mattress, and the remainder is unarmored, with bare soil where the slope is vertical, and some growth of shrubs where the slope is more shallow (Figures 3, 4). The more significant patches of marsh vegetation occur in: an area at the tip of the peninsula beyond the storage pond, which had been formerly treated to remove invasive *Spartina*; in a small embayment just east of the bridge; and on the north margin of Colma Creek opposite the WQCP. The marsh vegetation consists of predominantly native species such as pickleweed, saltgrass (*Distichlis spicata*), gumweed (*Grindelia stricta* var. *angustifolia*), and others.

Although we did not inspect habitat along the alignment of the south floodwall during the site visit, available imagery suggests that vegetation is similar to that seen at the north floodwall alignment, with intermittent shrub or herbaceous vegetation (Figure 5). Taken as a whole, the area of likely direct permanent disturbance from floodwall construction, which would occur at the top of bank only, has very little native vegetation. This condition is probably the result of regular disturbance from WQCP maintenance activities including, we suspect, placement of fill to treat erosion pockets.

Figure 3. North floodwall alignment view east of Colma Creek, articulated concrete mattress.

Figure 4. North floodwall alignment view of Colma Creek, unarmored bank.

Figure 5. View west of south floodwall alignment east end (furnished by Corps of Engineers).

We observed very little habitat present inland along Colma Creek (i.e., just west of the proposed project). In the vicinity of PS4, the creek is confined by existing floodwalls on both sides, and between the floodwalls there is a margin of low, sparse weeds growing on what appears to be deposited sediments. However, small patches of pickleweed have been documented elsewhere in the tidal portion of the creek west of State Highway 101 (Horizon 2016).

Wildlife use in the immediate vicinity includes birds either feeding during low tide in the mudflat, feeding while diving in the channels, resting during high tide, or seeking refuge from wind. Only common species, such as coots and gulls, were seen during the site visit, but other waterbird and songbird species are known to occur there, depending on time of year. Among these are sensitive species such as the saltmarsh common yellow throat (*Geothlypis trichas sinuosa*) and Alameda song sparrow (*Melospiza melodia pusillula*). Ridgway's rail (*Rallus obsoletus*) was formerly present (ca. 2000-2003) but not since invasive *Spartina* eradication efforts that began in 2006 and resulted in the formation of mudflat in areas formerly vegetated by *Spartina*. Although the most recent protocol surveys for Ridgway's rail resulted in no detections of that species, 38 other bird species were noted, included warblers, sparrows, gulls, dowitchers, sandpipers, terns, and others (Stagnaro 2018). Habitat for the listed salt marsh harvest mouse (*Reithrodontomys raviventris*) is present, although in relatively small patches, reducing the likelihood of their presence. Due to the urbanized nature of the creek upstream, it would not support salmonid spawning, although more common bay fishes, both native and exotic, are probably present in the tidal channels.

RESOURCE CATEGORIES AND MITIGATION GOALS

The Service's Mitigation Policy (Policy) (FR 46:15 January 23, 1981) provides general guidance in making recommendations to conserve fish and wildlife resources. Under the Policy, resources are assigned to one of four Resource Categories, with a mitigation goal consistent with the values provided to fish and wildlife and the rarity of that habitat (cover-type). A mitigation goal is assigned ranging from "no loss of existing habitat value" (Resource Category 1) for the most valuable kinds of habitat to "minimize loss of habitat value" (Resource Category 4) for the less valuable and most common kinds of habitat. Application of the Policy involves designating cover-types which may be affected and assigning evaluation species based on the sensitivity of those species to the project action, their role in the ecosystem, or association with Service-wide resource management issues such as conservation of anadromous fish and migratory birds. We then state the Resource Category, the rationale for that selection, and the corresponding mitigation goal.

We are limiting the resource category designation to the upland cover-type which would be directly impacted by the construction. This upland cover-type is present along portions of the alignment of north and south floodwalls for the WQCP and would be removed, some permanently, as it is within the floodwall footprint. Based on observations made during the site visit, the quality of this vegetation varies from very sparse low plants to denser shrubs and perhaps smaller trees. In association with the creek channel and high marsh, the upland could provide limited values as foraging habitat for songbirds like the saltmarsh common yellowthroat and other passerine birds. Although this type of upland is not locally abundant, the particular locations identified for floodwall construction already experience regular disturbance from WQCP activities, and similar uplands will remain on the north side of Colma Creek. A modest area of upland adjacent to tidal emergent marsh does have value as roosting habitat for birds and as refugium for wildlife during high tidal flood events. A native species like the California vole (*Microtus californicus*) would be an appropriate evaluation species. Considering both the regional abundance as well as the importance of preserving some uplands near tidal habitats, we designate upland as Resource Category 4, with a mitigation goal to minimize loss of habitat value.

Other cover-types in the area which could be indirectly affected by the project, include tidal emergent marsh, tidal creek, mudflat, subtidal benthos, and open bay water. None of these cover-types would be adversely affected by project construction. Rather, they would benefit from the project reducing the risk of being impacted from uncontrolled sewage release due to flooding.

FUTURE WITHOUT THE PROJECT

Without the project, the WQCP and PS4 would remain susceptible to damage due to coastal flooding. Currently, without sea level rise, the WQCP would begin to flood at around the 1% annual chance of exceedance, and this risk and depth of flooding will increase over time with sea level rise. If PS4 were to become inoperable during a flooding event, sewage could not be conveyed to the WQCP for treatment. If the WQCP were to flood, it could lose power and the ability to accept, treat, and/or store sewage. Electrical systems could be severely damaged by saltwater. With an outage of either facility, continued generation of sewage by customers would overwhelm the collection system, and the untreated overflow could end up in the storm drain system or streets, eventually discharging into Colma Creek and San Francisco Bay. Releases of sewage could continue for some period at least until emergency measures were taken, and could persist at some level until the facilities are repaired and functional. There is no immediate means to replace or substitute the lost treatment function, or to transport sewage elsewhere for treatment.

The release of untreated sewage into the environment would have multiple adverse effects, the scope and extent of which cannot be precisely quantified, although the mechanisms are well known. Sewage contains elevated quantities of acids, salts, drugs, heavy metals, petrochemicals, herbicides, pesticides, fertilizers, and other chemicals, all of which can adversely affect fish and wildlife resources and their habitats. Certain chemicals such as heavy metals biomagnify, that is, become more concentrated in animal tissues and hence have greater adverse effects as they are passed up the food chain. Some of these effects include increased mortality, reduced reproduction, oxygen depletion, excessive algal production, and illness from exposure/ingestion. Sewage also contains elevated quantities of microplastics and other debris, which would be dispersed throughout Colma Creek and nearby bay waters, and habitats. Local wildlife could be affected by sewage constituents either by direct contact, or through ingestion, including the forage organisms of fish and birds.

This suite of adverse effects could potentially occur whenever the first significant impacting event is exceeded, which is at a lower, more frequently exceeded elevation than the design event. The regularity and consequences of such events, as well as disturbance during any cleanup effort, would result in an incremental, local reduction in fish and wildlife resource populations, and a diminution of the quality of their supporting habitat. This damage would likely affect at least all of the tidal habitat at the mouth of Colma Creek (34 acres channels; 14 acres vegetated tidal marsh; 82 acres mudflat), as well as areas beyond the mouth, such as adjacent open waters and benthos, and additional mudflat fringe habitats to the north and south.

FUTURE WITH THE PROJECT

With the project, the sewage treatment facilities would remain fully functional, and fish and wildlife resources would remain unaffected by sewage, during all coastal events up to the projected 0.2% annual chance of exceedance event with intermediate sea level rise over the next 50 years. This provides substantially more protection against flooding compared to the without project scenario. A modest amount of upland would be permanently lost at the expense of the floodwall footprint (~1/4 acre). Wildlife could be disturbed by movement and noise from floodwall construction, which is expected to take one year.

DISCUSSION

As described, the proposed project of constructing floodwall protection for the WQCP and PS4 would have minimal impacts on upland habitat or associated wildlife. Protection of these facilities not only preserves function for customers, but greatly reduces the risk and consequences of environmental damage caused by release of untreated sewage during coastal flood events. The alignment of the north floodwall is designed to avoid impacts to marsh habitat in the vicinity of the pedestrian bridge.

One element that may deserve refinement is the channel slope in the vicinity of the north floodwall alignment. This is along the outside bend of the creek channel which, on first inspection, appears to be subject to enough erosion already to warrant prior placement of articulated concrete mattress. Portions without such mattress appear to have a steep slope with some active erosion. This is very near the proposed north floodwall. We recommend the Corps evaluate the future integrity of this bank and proposed floodwall with sea level rise and determine if there is a need for any structural measure to stabilize the bank and ensure stability of the floodwall. If so, we recommend that the Corps examine opportunities for structures that include or attract living components.

CONCLUSION

The Lower Colma Creek Section 103 Study project would protect critical water treatment infrastructure from coastal flooding and consequent release of untreated sewage that would otherwise damage sensitive environmental resources. We recommend that it be constructed as proposed by the Corps.

RECOMMENDATIONS

We recommend that the Corps:

1. Implement the project as proposed;

2. Evaluate Colma Creek bank integrity in the vicinity of the proposed north floodwall and opportunities for structures that include living components;

3. Evaluate effects of the project on listed species, initiate consultation as appropriate with the Service and National Marine Fisheries Service, and implement any additional measures determined by such consultation to be needed to minimize or offset any effects; and

4. Consider measures to maximally avoid impacts to migratory birds utilizing the upland habitat that would be impacted, such as timing the removal of vegetation outside the nesting season.

REFERENCES

Horizon [Horizon Water and Environment]. 2016. Colma Creek Flood Control Channel Maintenance Project - Initial Study/Mitigated Negative Declaration. June 2016. (HWE 15.037). Prepared by Horizon Water and Environment for the San Mateo County Department of Public Works Oakland, CA. 550 pp.

Stagnaro, B. 2018. Memorandum to San Mateo County Department of Public Works. Subject: Colma Creek Ridgway's Rail 2018 Survey Results. BioMaAS, San Francisco, CA. 7 pp.

6. NEPA Coordinating Agency Letters

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

August 12, 2021

Tessa Beach, Ph.D.
Chief, Environmental Services Branch
U.S. Army Corps of Engineers, San Francisco District
450 Golden Gate Avenue
San Francisco, California 94102-3404

Subject: National Environmental Policy Act Cooperating Agency Request for the Lower Colma Creek Coastal Flood Risk Management Feasibility Study, San Mateo County, California

Dear Dr. Beach:

The U.S. Environmental Protection Agency has reviewed the July 21, 2021 letter from the U.S. Army Corps of Engineers requesting the EPA serve as a cooperating agency in the NEPA process to manage the risk of coastal flooding to the South San Francisco Water Quality Control Plant and pump stations potentially impacted by sea level rise and flooding. The Environmental Review Branch accepts the Corps' invitation to participate as cooperating agency, as defined under the National Environmental Policy Act. Note that we currently do not anticipate any EPA actions associated with this project.

We look forward to working with the Corps to ensure that coordination assists both of our agencies in meeting statutory missions. To the extent that time and resources allow, the EPA will:

1. Participate in the NEPA process, including attending interagency coordination meetings and the public scoping process. We are interested in reviewing draft design reports and scientific studies that relate to bioengineered alternatives and the beneficial reuse of dredged materials, and potential impacts to water quality, air quality, wetland, or riparian resources. Due to limited travel funding and COVID-19, participation is likely to occur via teleconference.

2. Assist the Corps in identifying significant environmental issues, particularly those that relate to the EPA's special expertise and jurisdiction, such as air and water quality, wetlands, and environmental impact assessments. The EPA will also share resources to assist in the analyses of environmental justice and climate change considerations.

3. Strive to provide comments on preliminary versions of the Draft and Final NEPA documents to the Corps within 30 days.

4. If requested by the Corps, assist with responses to public comments that concern EPA's areas of expertise and jurisdictional responsibilities.

5. Consult with the Corps on changes to the NEPA process and work with it to ensure that the content of the Environmental Assessment is consistent with any EPA program or agency requirements.

Please note that the EPA's status as a cooperating agency does not affect our independent responsibilities under Section 309 of the Clean Air Act to review and comment publicly on all Environmental Impact Statements or other NEPA documents. Participation as a cooperating agency does not imply endorsement of the proposed project, nor can it be used as the basis to obligate, commit, or transfer funds. Please incorporate by reference this acceptance letter into the Draft and Final NEPA documents.

EPA looks forward to working with the Corps and other cooperating agencies on this project. If you have any questions please feel free to contact me at 415-947-4167, or contact Robin Truitt who will serve as EPA's point of contact as a cooperating agency at 415-972-3742, 415-380-9923 or Truitt.Robin@epa.gov.

Sincerely,

for Jean Prijatel
Manager, Environmental Review Branch

cc: Jeneya Fertel, U.S. Army Corps of Engineers, San Francisco District

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

September 3, 2021 **Refer to NMFS No:** INQ-2021-00147

Tessa E. Beach, Ph.D.
Chief, Environmental Services Branch
San Francisco District
U.S. Army Corps of Engineers
450 Golden Gate Avenue
San Francisco, California 94102-3404

Re: National Environmental Policy Act Cooperating Agency Response for the Lower Colma Creek Coastal Storm Risk Management Feasibility Study, South San Francisco, California

Dear Dr. Beach:

Thank you for your July 21, 2021, letter inviting NOAA's National Marine Fisheries Service (NMFS) to participate as a cooperating agency in the preparation of documents pursuant to the National Environmental Policy Act (NEPA) for the Lower Colma Creek Coastal Storm Risk Management Feasibility Study in South San Francisco, California.

NMFS has jurisdiction under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), the Magnuson Stevens Fishery Conservation and Management Act (16 U.S.C. 1801-1882), and the Fish and Wildlife Coordination Act (16 U.S.C. 661). With this letter, we accept your invitation and offer to assist with NEPA development tasks related to assessment of potential impacts and conservation measures for NMFS' trust resources. We wish to limit our attendance at meetings to those where effects to listed fish, designated critical habitat, and essential fish habitat will be discussed.

The NMFS lead contact for this process will be Brian Meux of my staff. Brian can be reached by email at brian.meux@noaa.gov or by phone at 707-575-1253. Please provide background materials and a schedule for development milestones when available, and prior to public scoping. We look forward to working with the Corps of Engineers on this important project.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

cc: Jeneya Fertel (jeneya.a.fertel@usace.army.mil Corps of Engineers, San Francisco, CA
Shelby Mendez (shelby.l.mendez@noaa.gov) NMFS, Long Beach, CA
Copy to E-Folder ARN 151422WCR2021SR00134