

EBDA FIRST MILE HORIZONTAL LEVEE PROJECT

Habitat Assessment

Prepared for
East Bay Dischargers Authority

October 2021



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SUMMARY

This report presents the results of Environmental Science Associates' (ESA) survey of biological resources within the immediate and surrounding area of the 230-acre EBDA First Mile Horizontal Levee Project (Project), located in the City of Hayward, California. The Project intends to use "green infrastructure" to provide sea level rise resilience, water quality improvement, and habitat protection. The purpose of this report is to describe site conditions and assess the suitability of the Study Area to support special-status species and sensitive habitat types. This report may be used in support of regulatory permitting and California Environmental Quality Act (CEQA) compliance.

This baseline report provides information on plant and wildlife species found on or potentially occurring in the Study Area and includes a description of habitat types and their characteristic plant and wildlife species. It also includes an analysis of sensitive habitats and special-status plant and wildlife species present or potentially present. The following upland habitat types occur in the Study Area: non-native grassland, native grassland, ruderal, and developed. Aquatic habitat types in the Study Area include tidal salt marsh, non-tidal emergent wetland, riparian, seep, tidal channel, tidal pond, and non-tidal channel.

The Study Area provides suitable habitat for one special-status plant species, Congdon's tarplant.

The Study Area provides suitable habitat for special-status fish and wildlife species including Central California Coast steelhead DPSs, longfin smelt, California black rail, California Ridgway's (California clapper) rail, northern harrier, white-tailed kite, saltmarsh common yellowthroat, Alameda song sparrow, burrowing owl, salt marsh harvest mouse, salt marsh wandering shrew, and hoary bat.

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CHAPTER 1

Introduction

1.1 Background and Purpose for the Habitat Assessment

This report includes a description of the presence and distribution of special-status plant and wildlife species, sensitive natural communities, and potential state- and federally-regulated waters and wetlands at the Study Area of the proposed East Bay Dischargers Authority (EBDA) First Mile Horizontal Levee Project (Project).

The intent of this document is to characterize the existing biological resources at the Study Area to support environmental permitting, CEQA documentation, and restoration design.

Information used in the preparation of this report was obtained from regional biological studies, reports from the California Natural Diversity Database (CDFW, 2021), California Native Plant Society Electronic Inventory (CNPS, 2021), and U.S. Fish and Wildlife IPaC species list (USFWS, 2021), reconnaissance-level field survey, and other biological literature.

Vegetation types and wildlife habitats were identified using records, field observations, and aerial imagery. Environmental Science Associates (ESA) conducted biological reconnaissance-level surveys of the Study Area on March 15, 2021 to gather information and verify existing data on vegetative communities, wetlands, wildlife habitats, and potential habitat use on and surrounding the site.

1.2 Project Description

The goal of the “First Mile” Horizontal Levee Project is to expand the concept behind the Oro Loma Horizontal Levee Demonstration Project to full scale, or approximately one mile, though the actual length of the levee will be determined through this project. The project will be located south of the treatment plant and Bockman Canal in an area known as Oro Loma Marsh.

A Horizontal Levee, is a multi-benefit project that uses “green infrastructure” to provide sea level rise resilience, water quality improvement, and habitat protection. The habitat created is important because many of the existing marshlands are projected to be under water (especially when sea level rise is coupled with a storm surge). Providing an upland transition zone will help protect the many species that make the marsh their home. The horizontal portion of the levee also absorbs energy, which conceptually reduces the freeboard height requirement for the FEMA-certified levee and lowers the design levee crest elevation. This multi-benefit solution could provide benefits to EBDA in terms of flood protection and natural polishing of treated wastewater, while it also provides value to the communities EBDA serves.

1.3 Description of Study Area

The Study Area is located in the City of Hayward and encompasses a portion of the Oro Loma Marsh, which is part of the Hayward Regional Shoreline. The Study Area abuts Sulphur Creek to the south, railroad tracks to the east, a drainage channel to the north, and the San Francisco Bay Trail along San Francisco Bay to the west. Just east of the railroad tracks is the San Lorenzo Community Center Park and Skywest Golf Course. Commercial and waste and flood water infrastructure occur to the North and South of the Study Area. The Study Area and details about the project location are shown in **Figure 1**.

The East Bay Regional Park District (EBRPD) owns most of the land within the Study Area. There is also a portion owned by the State of California on the east side of the Study Area, as well as some land owned by the USA. Oro Loma Sanitary District owns the land to the North West of the Study Area.

A major utilities corridor now crosses the middle of the Site from north to south, including PG&E transmission lines and towers, an underground electrical distribution line, one regional sewage distribution pipe, and a jet fuel pipeline. Northern and southern access levees were constructed at elevation 11.0 and 8.5 feet NGVD respectively to provide maintenance access for PG&E personnel to the transmission towers (Lenington, 2001).



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SOURCE: ESRI, ESA

EBDA First Mile Horizontal Levee Project



Figure 1
Study Area

1.3.1 Regional Setting

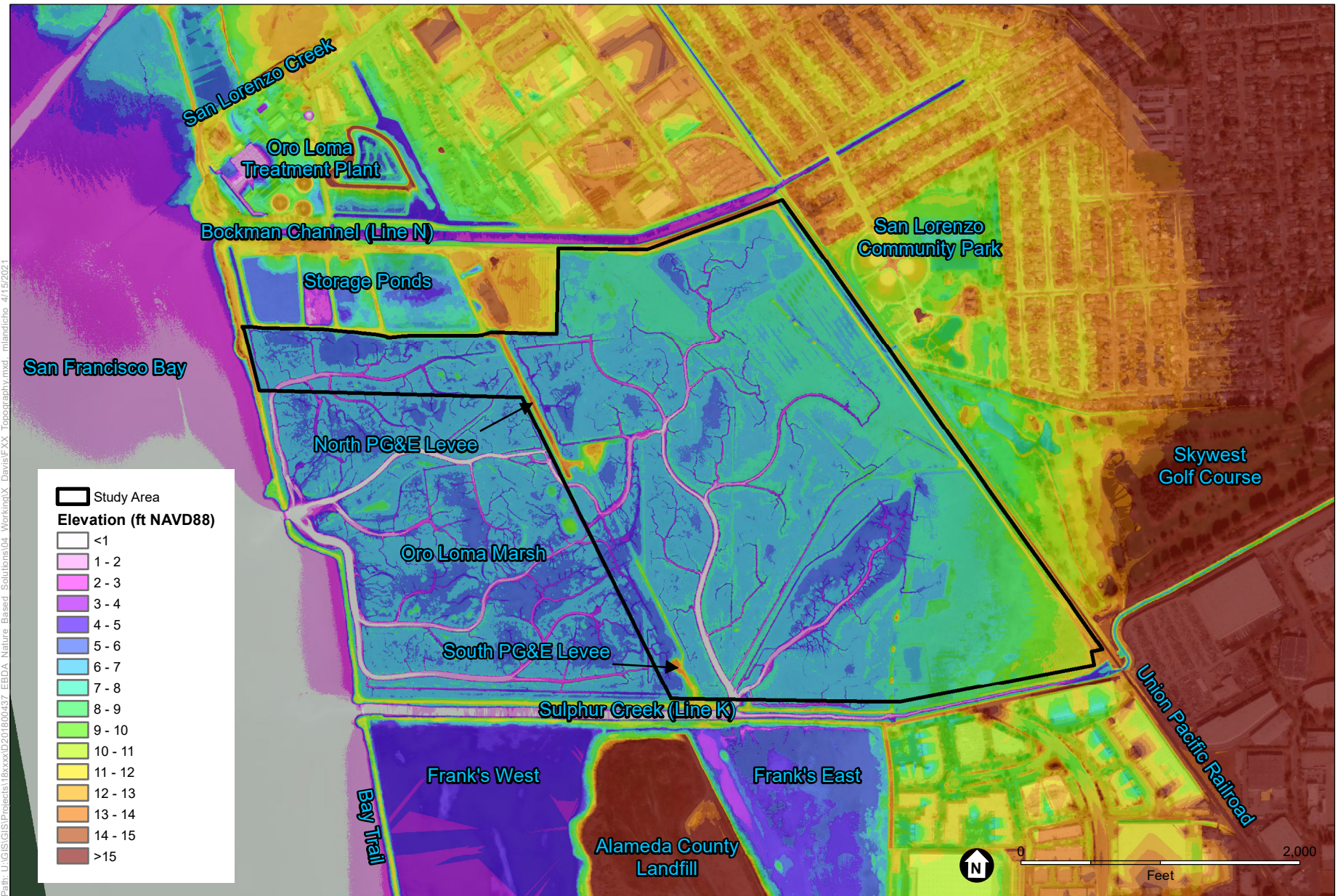
The Study Area is located in Alameda County on the east shore of San Francisco Bay. Alameda County has a diverse topography and microclimate, and has an associated high diversity of vegetation, although development in the region, has resulted in a substantial reduction in land available for native flora and fauna. San Francisco Bay has lost 80 percent of its historic tidal wetlands.

Oro Loma Marsh is within the South San Francisco Bay (South Bay) which includes some of the most important habitat remaining in the Bay Area for a number of wildlife species (Goals Project 1999). This region differs in several physical and ecological aspects from the other areas of the San Francisco Bay Estuary. The habitats included in the South Bay are open waters and subtidal and intertidal habitats (largely mudflats) that extend to the upper reaches of tidal action, tidal and nontidal wetlands, and former salt evaporation ponds adjacent to the Bay, and the upland areas immediately adjacent to these features.

The Study Area is within the City of Hayward which contains largely developed areas with urban and suburban uses with the City of San Lorenzo just to the north of the Study Area. The waterways of Bockman Canal and Sulphur Creek watersheds surround Oro Loma Marsh, but flow entirely through underground culverts and engineered channels to drain the low lying areas of San Lorenzo and the northwest section of Hayward. The two watersheds drain to San Francisco Bay through the Hayward Regional Shoreline Park where former salt evaporation ponds have been restored to tidal marsh.

1.3.2 Topography

Existing elevations at the project site and vicinity based on the City of Hayward's 2020 LiDAR topography are presented in **Figure 2**. The vertical datum on elevations referred to is NAVD88. Oro Loma Marsh is bisected by two PG&E access levees (north and south). The marshplain west of the utility corridor ranges from 4 to 7 feet, with a few small upland mounds around elevation 8 to 10 feet. Marshplain elevation increases gradually to the east, with remnant agricultural fields (7 to 9 feet) fringing the eastern boundary. The highest site elevations, that aren't berms, occur in the southeast corner ranging in elevation from 8 to 12 feet with a gradual transition from wetlands to uplands. The tops of the berms or levees surrounding the marsh and the PG&E access levees range from 11 to 14 feet.



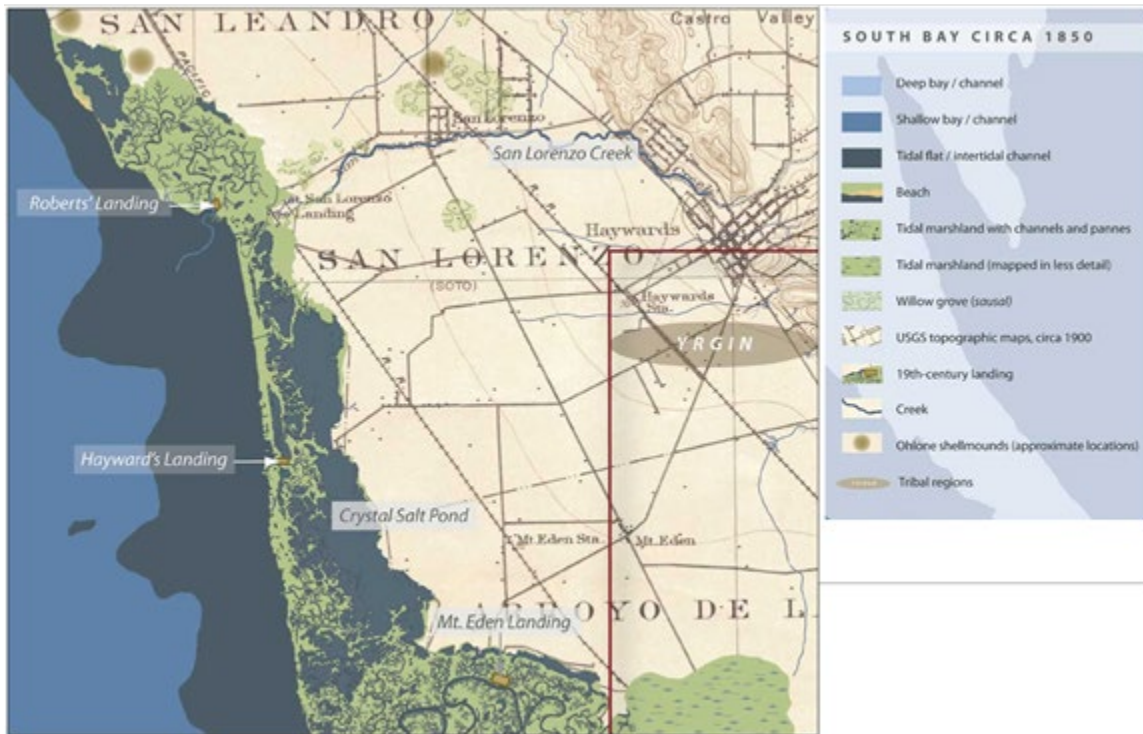
SOURCE: ESRI Service Layers; LiDAR (City of Hayward, 2020)

EBDA First Mile Horizontal Levee Project

Figure 2
 Topographic Elevations

1.3.3 Ecological Site History

The Study Area was thought to historically be mostly a mixture of tidal marsh and tidal channels and flats (**Figure 3**). The anthropogenic history of the Study Area is not well known however it is known that at least a portion of the site was used for commercial salt production at one time. Levees were originally built in Hayward and San Lorenzo to create land for salt production. Landings were established along the shoreline in the 1850's to ferry passengers and move salt and agricultural products to San Francisco. During the early part of the 1900's additional uses included waterfowl hunting and cattle grazing. There is some evidence that the western shoreline presently extends further into the Bay than during the 19th century, probably due to a combination of natural accretion and placement of fill materials (Lenington, 2001).



Source: SFEI and Oakland Museum of California, 2005.

Figure 3
Hayward Historical Baylands Map

Tidal restoration of the Oro Loma Marsh was implemented in 1997 with one breach to San Francisco Bay at the Bayshore levee which restored the western portion of Oro Loma Marsh (Oro Loma West) and one breach at Sulphur Creek which restored the eastern half of Oro Loma Marsh (Oro Loma East) to tidal influence. Oro Loma West is known to be lower in elevation than Oro Loma East and therefore continues to maintain more mudflat and low marsh habitat than Oro Loma East which contains more high marsh habitat (i.e. pickleweed dominated and denser vegetation). Several higher elevation islands were created during the 1997 restoration including several on the east side of Oro Loma East which were meant to provide potential burrowing owl habitat, however no burrowing owls have been detected using these mounds since they were created.

The North East corner of the Study Area is the 18-acre Port of Oakland Mitigation Marsh which was constructed in 2000 (Huffman-Chow and Hoffman & Associates, Inc, 2000). The mitigation area was previously separated from the rest of the site by levees and a drainage channel and placed fill material maintained this area as disturbed upland habitat. The mitigation planned to create 5 acres of seasonal wetland and 9 acres of salt marsh. The site appears to now contain all salt marsh with several tidal channels and ponds within the mitigation site.

The Invasive *Spartina* Project has done some work at Oro Loma Marsh including treatment of invasive and hybrid cordgrass (*Spartina alterniflora*) and planting of native Pacific cordgrass (*Spartina foliosa*) and marsh gumplant (*Grindelia stricta*) seedlings (OEI 2012, 2016a). Marsh gumplant was planted within the Study Area in the marsh plain and existing higher elevation features between 2011 and 2015 (OEI 2016b). Pacific cordgrass started being introduced within the Study Area in the eastern half of Oro Loma Marsh in 2016 when the hybrid cordgrass was nearing eradication (OEI 2016a). Expansion of Pacific cordgrass plots within the southeastern portion of the Study Area can be observed within Google Earth within what was known as the Minimum Area Pond from the 1997 tidal restoration project. In general, the Study Area continues to evolve into more and more vegetated marsh plain in areas that once were dominated by mudflat after the 1997 restoration. Hybrid cordgrass (*Spartina alterniflora* x *foliosa*) was observed on site during the reconnaissance survey so appears to not be eradicated from the site, but was not observed in large patches (Baye, 2021).

1.4 Regulatory Context

Biological resources in the Study Area, including special-status species, wetlands, and sensitive natural communities, may fall under the jurisdiction of various regulatory agencies and be subject to their regulations and permit requirements. Biological resources observed within the Study Area, or with potential to occur in the Study Area, as described in *Section 3: Environmental Setting*, may be subject to the regulations described below. Additionally, some sensitive biological resources described in this report may occur outside of, but adjacent to the Study Area. If affected by Project activities, these resources also could be subject to regulatory considerations.

1.4.1 Federal Regulations

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered. Two federal agencies oversee the FESA: the U.S. Fish and Wildlife Service (USFWS) has jurisdiction over plants, wildlife, and resident fish, while the National Marine Fisheries Service (NMFS) has jurisdiction over anadromous fish, marine fish, and marine mammals.

Section 7 of FESA requires a federal agency reviewing a project within its jurisdiction to determine whether any federally listed threatened or endangered species may be present in the Study Area and whether the proposed action will have a potentially significant impact on such species. In addition, the agency is required to determine whether the proposed action is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in

the destruction or adverse modification of critical habitat proposed to be designated for such species. The USFWS designates critical habitat for threatened or endangered species under FESA. Critical habitat designations are specific areas within the geographic region that are occupied by a listed species that are determined to be critical to its survival and recovery in accordance with FESA. Federal entities issuing permits or acting as a federal agency must show that their actions do not negatively affect the critical habitat to the extent that it impedes the recovery of the species.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA), administered by the USFWS, is the domestic law that affirms, or implements, a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. It generally prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs, and nests, except as provided by the statute. The federal MBTA definition of “take” does not prohibit or penalize the incidental take of migratory birds that results from actions that are conducted without motivation to harm birds.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act, enforced by the USFWS, makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*) or parts thereof.

The Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended (16 USC 1801), requires that Essential Fish Habitat (EFH) be identified and described in Federal fishery management plans (FMP). Federal agencies must consult with NMFS on any activity which they fund, permit, or carry out that may adversely affect EFH.

Waters of the U.S.

The U.S. Army Corps of Engineers (USACE) has primary federal responsibility for administering regulations that concern waters of the U.S. In this regard, the USACE acts under two statutory authorities: the Rivers and Harbors Act, which governs specified activities in “navigable waters,”¹ and the Clean Water Act, which governs specified activities in waters of the U.S., including wetlands.

Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. § 403) requires authorization from the USACE for work or structures in or affecting navigable waters of the U.S. The term “navigable waters of the U. S.” generally includes those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. A determination of navigability, once made,

¹ Navigable waters are defined as those waters that are subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity (33 C.F.R. §329.4).

Section 14 of the RHA of 1899 (33 U.S.C. § 408), commonly referred to as “Section 408,” authorizes the USACE to grant permission to alter, occupy, or use a USACE civil works project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project.

Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972.

In 1986, the term “waters of the United States” was defined as follows (33 CFR 328.3[a]):

- (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (2) All interstate waters including interstate wetlands;
- (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (iii) Which are used or could be used for industrial purpose by industries in interstate commerce;
- (4) All impoundments of waters otherwise defined as waters of the United States under the definition;
- (5) Tributaries of waters identified in paragraphs (a)(1) through (4) of this section;
- (6) The territorial seas; and
- (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1) through (6) of this section.
- (8) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands (including swamps, bogs, seasonal wetlands, seeps, marshes, and similar areas) are also considered waters of the U.S. (subject to the significant nexus test), and are defined by USACE as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3[b]; 40 CFR 230.3[t]). Indicators of three wetland parameters (i.e., hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by field investigation, must be present for a site to be classified as a wetland by USACE (Environmental Laboratory 1987).

Section 401 of the CWA gives the state authority to grant, deny, or waive certification of proposed federally licensed or permitted activities resulting in discharge to waters of the U.S. The State Water Resources Control Board (State Water Board) directly regulates multi-regional projects and supports the Section 401 certification and wetlands program statewide. The Regional Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal CWA, which specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the State or appropriate interstate water pollution control agency in/where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

The USACE requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. Some classes of fill activities may be authorized under Regional General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under FESA). The Nationwide permit outlines general conditions and may specify project-specific conditions as required by the USACE during the Section 404 permitting process. When a project’s activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued by the USACE.

1.4.2 State Regulations

Waters of the State

Most projects involving water bodies or drainages are regulated by the RWQCB, the principal State agency overseeing water quality of the State at the local/regional level. The survey area is located within the jurisdiction of the San Francisco Bay RWQCB. Where waters of the State overlap with waters of the U.S., pending verification from the USACE, those waters would be regulated under Section 401 of the CWA.

In the absence of waters of the U.S., waters may be regulated under the Porter-Cologne Water Quality Control Act if project activities, discharges, or proposed activities or discharges could

affect California's surface, coastal, or ground waters. The permit submitted by the applicant and issued by RWQCB is either a Water Quality Certification in the presence of waters of the U.S. or a Waste Discharge Requirement (WDR) in the absence of waters of the U.S.

Rivers, Streams, and Lakes

Pursuant to Division 2, Chapter 6, Section 1600 et seq. of the Fish and Game Code (FGC), California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream, or lake which supports fish or wildlife. A notification of a Lake or Streambed Alteration Agreement must be submitted to CDFW for “any activity that may substantially change the bed, channel, or bank of any river, stream, or lake.” In addition, CDFW has authority under FGC over wetland and riparian habitats associated with lakes and streams. The CDFW reviews proposed actions, and if necessary, submits to the applicant a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the applicant is the Lake or Streambed Alteration Agreement (LSAA).

Nesting Birds

Under FGC Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds of prey), or of their nests and eggs. Under FGC 3513 It is unlawful to take any migratory nongame bird as designated in the MBTA or any part of such bird, except as provided by rules or regulations adopted by the Secretary of the Interior under the MBTA. On November 29, 2018 CDFW affirmed California’s protections for birds including a prohibition of incidental take of migratory birds.

California Fully Protected Species

FGC Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians) and 5515 (fish) allow the designation of a species as fully protected. This is a greater level of protection than is afforded by the California Endangered Species Act, since such a designation means the listed species cannot be taken at any time. Salt marsh harvest mouse (*Reithrodontomys raviventris*), California Ridgway’s rail (*Rallus obsoletus obsoletus*), golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), and California black rail (*Laterallus jamaicensis coturniculus*) are California fully protected species.

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the Guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a “candidate species” that has not yet

been listed by either the USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

CEQA also specifies the protection of other locally or regionally significant resources, including natural communities or habitats. Although natural communities do not presently have legal protection, CEQA requires an assessment of such communities and potential project impacts. Natural communities that are identified as sensitive in the CNDDDB are considered by CDFW to be significant resources and fall under the CEQA Guidelines for addressing impacts. Local planning documents, such as general and area plans, also often identify sensitive natural communities.

1.4.3 Regional Regulations

San Francisco Bay and Shoreline

The San Francisco Bay Conservation and Development Commission (BCDC) has regulatory jurisdiction, as defined by the McAteer-Petris Act, over the Bay and its shoreline, which generally consists of the area between the Bay shoreline and a line 100 feet landward of and parallel to the shoreline.

CHAPTER 2

Methods

2.1 Study Area

The use of the term “Study Area” refers to the area generally defined by the potential Project boundary (Figure 2, above). The Study Area includes parcels and waterways owned by East Bay Regional Park District, USA, and the State of California, and encompasses an area of approximately 230 acres.

The Study Area abuts Sulphur Creek to the south, railroad tracks to the east, Bockman channel to the north, and San Francisco Bay to the west.

Note that although the project footprint is generally the starting point to define a biological survey area, in practical terms, biological resources have varied sensitivity to disturbance and a slightly larger Study Area is typically needed for many species including nesting raptors, passerine birds, and many terrestrial species that may be located adjacent to a property.

2.2 Survey Dates and Surveying Personnel

Environmental Science Associates (ESA) wetland restoration ecologist Stephanie Bishop, botanist Joseph Sanders, and biologist Ally Sung-Jereczek conducted a reconnaissance-level plant and wildlife survey of the Study Area on April 2, 2021. The surveys were conducted to observe and characterize vegetation communities in the Study Area and to assess habitat quality and potential for common and special-status wildlife species and verify conditions described in site specific studies. The reconnaissance surveys are intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Study Area. The site visits do not constitute protocol-level surveys and are not intended to determine the actual presence or absence of a species.

2.3 Review of Background Information

Some site specific biological studies and surveys have been performed for the Study Area over the years. These, along with publicly available data and subscription-based biological resource data, were evaluated to provide a foundation of existing biological conditions in this report.

Data sources that assisted in this analysis include:

- Topographic maps

- Historic and current aerial imagery
- USFWS Information for Planning and Conservation (IPaC), USFWS, 2021
- The CDFW California Natural Diversity Database (CNDDB), CDFW, 2021
- The California Native Plant Society (CNPS) online database, CNPS, 2021

CHAPTER 3

Environmental Setting

This chapter provides the environmental baseline for vegetation communities and habitats and special-status plant and wildlife species in the Study Area. Habitat types occurring within the Study Area are briefly described below. **Figure 4** shows the distribution of these habitats in the Study Area and **Appendix A** shows representative photos of these habitats within the Study Area.

3.1 Habitat Types

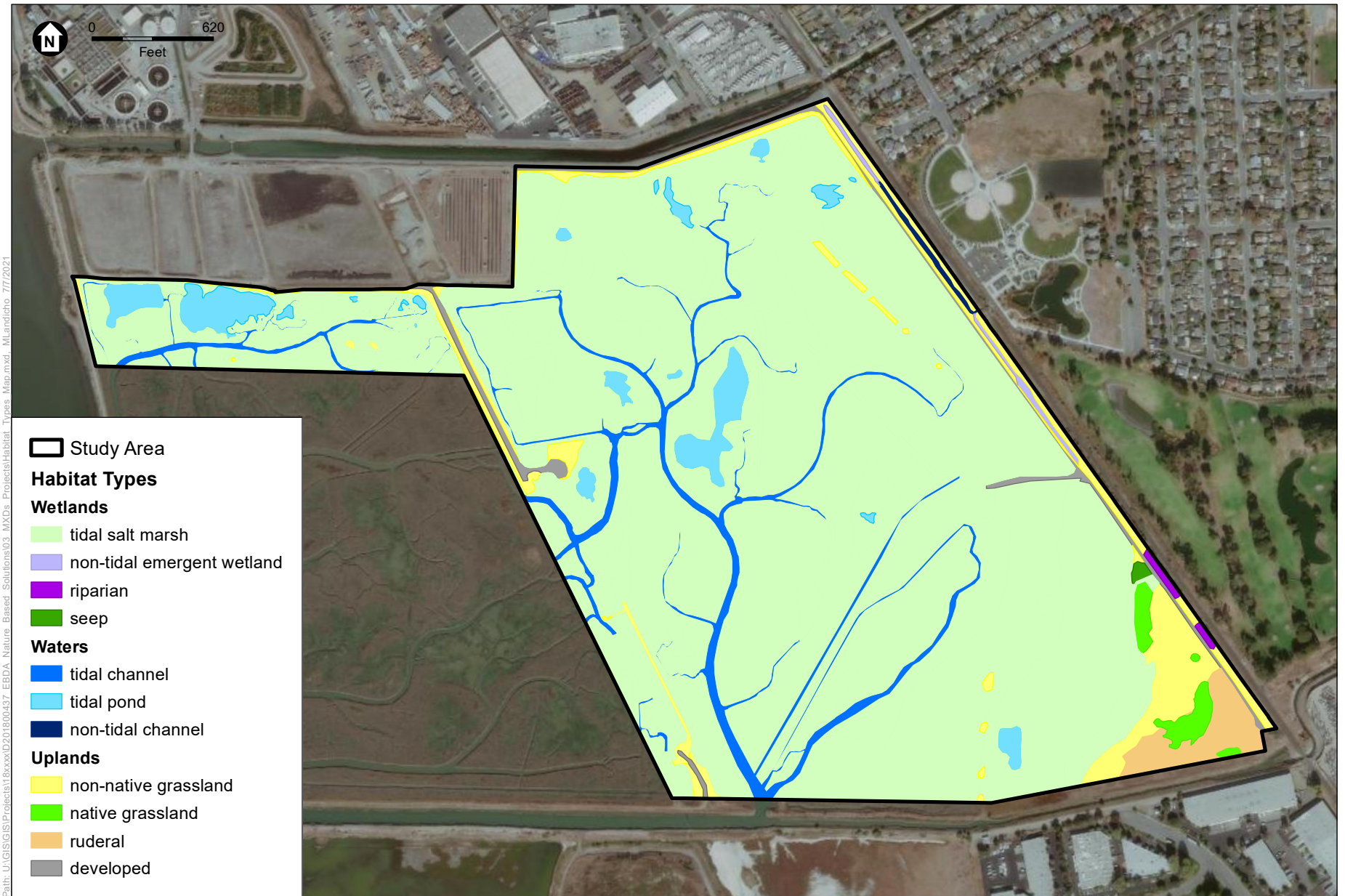
Plant communities are assemblages of plant species that occur together, and are defined by species composition and relative abundance. Plant communities generally correlate with wildlife habitat types. The vegetation classification system and associated wildlife habitats presented herein are based on field observations, and are largely consistent with the *Manual of California Vegetation* (MCV; Sawyer, et. al, 2009), *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986), and *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). For the purpose of the level of analyses presented here, some vegetation communities and habitat types were grouped into broader habitat types than in their respective reference texts.

The study area contains four upland habitat types and seven habitat types associated with aquatic features. The following upland habitat types occur in the Study Area: non-native grassland, native grassland, ruderal, and developed. Aquatic habitat types in the Study Area include: tidal salt marsh, non-tidal emergent wetland, riparian, seep, tidal channel, tidal pond, and non-tidal channel. Habitat types within the Study Area are presented in Figure 5. **Table 1** provides a summary of the habitat types by acreages. Dominant vegetation and wildlife observed during the reconnaissance surveys are provided under each of the habitat types described below. Species nomenclature used in this report follows CNDDDB taxonomic standards (CDFW, 2021).

3.1.1 Upland Habitat Types

Non-native Grassland

Non-native grassland occurs along the upland edges in the Study Area, primarily restricted levee slopes, built mounds in the marsh, and the natural upland transition areas in the southeast corner of the site. The grassland is dominated by common non-native and invasive grasses such as wild oats (*Avena* spp.) and ripgut brome (*Bromus diandrus*).



SOURCE: ESRI, ESA

EBDA First Mile Horizontal Levee Project

Figure 4
Habitat Types

**TABLE 1
HABITAT TYPES BY ACREAGES**

Habitat Type	Acreage
Upland Habitat Types	
Non-native grassland	12.72
Perennial grassland	0.77
Ruderal	4.16
Developed	3.61
Aquatic Habitat Types	
Tidal salt marsh	190.88
Non-tidal emergent wetland (permanent freshwater wetland)	0.66
Riparian	0.38
Seep	0.17
Tidal channel	10.48
Tidal pond	7.44
Non-tidal channel (flood control channel)	0.33
TOTAL	231.60

The majority of non-native grassland aligns with strips of uplands along levees and within the natural upland transition zone in the southeast corner of the site (Photo 1 in Appendix A). In areas adjacent to gravel roads and levees, that are fairly barren utilized by humans, wildlife use is likely limited. Some common wildlife that may use non-native grassland habitats include Canada geese (*Branta canadensis*), western fence lizard (*Sceloporus occidentalis*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and western meadowlark (*Sturnella neglecta*). The non-native grassland habitat in areas directly adjacent to tidal wetlands is important as refugia habitat for marsh wildlife during high tides, storms, and flood events. However, if there is limited cover or steep transitions, such as adjacent to levees and within the islands in the marsh, this refugia habitat can also be a high predation zone. Areas of wide transition space, such as in the southeast corner of the site, likely have less predation. Non-native grassland and its surrounding adjacent habitats are likely to provide minimal wildlife habitat, but may provide foraging and nesting habitat for a wide variety of birds.

Native grassland

Patches of perennial wildrye grassland can be found in the Study Area adjacent to a non-native grassland and ruderal areas and is dominated by creeping wildrye (*Elymus triticoides*), but also includes salt grass (*Distichlis spicata*), common bedstraw (*Galium aparine*), and common lippia (*Phyla nodiflora*) (Photo 2 in Appendix A). These areas provide important upland refugia habitat for marsh wildlife adjacent to tidal wetlands and represent high quality stands of regionally uncommon native vegetation, particularly adjacent to San Francisco Bay tidal marsh edges (Baye, 2021). This native grassland provides similar wildlife habitat as the surrounding non-native grassland, but it also can provide high quality nesting habitat for waterfowl. A mallard (*Anas*

platyrhynchos) was observed nesting within the creeping wild rye during the reconnaissance survey.

Ruderal

Although ruderal areas happen fairly intermixed with non-native grassland areas throughout the study area. There is one larger area in the southeast corner along the upper parts of the natural transition zone that is quite dense with tall non-native and invasive forbs. This area is dominated by poison hemlock (*Conium maculatum*), and also includes wild radish (*Raphanus sativus*), mustard (*Brassica nigra*), and cheeseweed (*Malva parviflora*) (see Photo 1 in Appendix A).

Ruderal vegetation can support diverse and abundant insect assemblages during flowering (late winter-spring), and seeds that support passerines and small mammals during the dry summer. The annual weed stands provide poor wildlife cover in late fall and early winter (Baye, 2021). Species that utilize non-native grassland habitat may also utilize ruderal vegetation as well as red-winged blackbird (*Agelaius phoeniceus*) and many other species of passerines.

Developed

Developed areas within the Study Area include the tops of levees (see Photo 3 in Appendix A). These areas are mostly devoid of vegetation as the result of soil compaction or lack of suitable substrate for plant establishment and growth. There is no public access to the levees at the site although the sanitary district, utilities companies with easements, and EBRPD employees access the levees. The Bay Trail just to the west of the study area does allow pedestrians, bicyclists, and dogs on leash. The dirt and gravel levee tops support few biological resources. The levees are likely used by wildlife to move between wetland and upland habitats. Developed levee tops provide limited wildlife habitat and usually support only generalist species (e.g., striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and common passerines).

3.1.2 Aquatic Habitat Types

Tidal Salt Marsh

Tidal marsh occurs within Oro Loma Marsh within the Study Area and supports mostly halophytic plant species. These areas are dominated primarily by pickleweed (*Salicornia pacifica*), but also contain other diverse tidal salt marsh assemblages including higher marsh species such as Oregon gumweed (*Grindelia stricta*), salt grass, and (*Frankenia salina*), and the low marsh species cordgrass, both the native and hybrid varieties (*Spartina foliosa* and *S. alterniflora*). The salt marsh around the east side of the Study Area supports an unusually diverse salt marsh vegetation for a tidal marsh restoration site that is less than 30 years old in San Francisco Bay (Baye, 2021). The wide high salt marsh/transition zone dominated by dense stands of tall gumplant and tall pickleweed mixed with alkali-heath provides high quality potential high tide refuge habitat for marsh wildlife in the existing salt marsh. Other relatively infrequent native South Bay salt marsh plants present included *Triglochin concinna*, and *Jaumea carnosa*, both of which occurred in small patches (Baye, 2021). See Photo 4 in Appendix A for a representation of the tidal salt marsh habitat. Some low marsh areas contain low density vegetation of pickleweed

and/or cordgrass, while other high marsh areas contain high density and high diversity of plant assemblages.

Tidal marsh vegetation throughout the Study Area provides nesting and foraging opportunities and cover for marsh bird species, including mallard, great blue heron (*Ardea herodias*), great egret (*Ardea alba*), marsh wren (*Cistothorus palustris*), Alameda song sparrow (*Melospiza melodia pusillula*), red-winged blackbird, salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), and small mammals such as raccoon, and California vole (*Microtus californicus*).

Raptors that are typical of marsh habitats include northern harrier (*Circus hudsonius*), red-tailed hawk (*Buteo jamaicensis*), white-tailed kite (*Elanus leucurus*), and American kestrel (*Falco sparverius*). During high tides, ducks that may be found in tidal marsh environments include northern shoveler (*Anas clypeata*), American wigeon (*Anas americana*), northern pintail (*Anas acuta*), gadwall (*Anas strepera*), and canvasback (*Aythya valisineria*).

Special-status wildlife that may occur within tidal salt marsh habitats includes salt marsh harvest mouse, California Ridgway's rail, and California black rail.

Non-Tidal Emergent Wetland

Non-tidal emergent wetland is dominated by cattail (*Typha spp.*) and occurs east of the levee in a drainage channel (Photo 5 in Appendix A). The cattails provide tall emergent vegetation for potential nesting and foraging habitat for song birds including marsh wren and Alameda song sparrow.

Riparian

Riparian habitat occurs in a small strip east of the levee on the east side of the Study Area and is dominated by arroyo willow (*Salix lasiolepis*) (Photo 3 in Appendix A). This willow area is fairly dense and could provide habitat for a many bird species and potentially hoary bat.

Seep

One seep area occurs in the southeast corner of the site and consists of a monotypic stand of Mexican rush (*Juncus mexicanus*) or potentially a hybrid with Baltic rush (*Juncus balticus x mexicanus*). This is a high quality small stand of a regionally uncommon native vegetation with high habitat value in a poorly drained area between tidal marsh and riparian habitat and adjacent to lowland grassland habitat. The seep provides habitat for wildlife moving between the tidal marsh and upland habitats. And may provide habitat for wildlife species found within the nearby tidal marsh, grassland, and riparian habitats.

Tidal Channel

Tidal channels occur throughout the study area within the marsh and are connected to San Francisco Bay and Sulphur Creek (Photo 6 in Appendix A). The tidal channels may provide foraging and roosting habitat for shorebirds at low tide such as western and least sandpiper (*Calidris sp.*), greater yellowlegs (*Tringa melanoleuca*), black-necked stilt (*Himantopus mexicanus*), short-billed dowitcher (*Limnodromus griseus*), and semi-palmated plover

(*Charadrius semipalmatus*). The tidal channel also provides habitat for ducks such as mallard, gadwall, green-winged teal (*Anas crecca*), and northern shoveler.

The tidal channels may also support native and non-native fish species including threespine stickleback (*Gasterosteus aculeatus*), Pacific staghorn sculpin (*Leptocottus armatus*), western mosquitofish (*Gambusia affinis*), and rainwater killfish (*Lucania parva*).

Tidal Pond

Tidal ponds occur throughout the marsh within the Study Area. These ponds occur at different sizes and depths but most are quite shallow and many may sometimes be mudflat (see Photo 4 in Appendix A). Many of these tidal ponds appear to be slowly filling in with vegetation and may evolve into tidal marsh over the next several years.

These tidal ponds scattered throughout the tidal marsh provide foraging and resting habitat for many species of waterbirds, including resident and overwinterers and migrating waterbirds. Most of the ponds are surrounded by a wide buffer of tidal marsh which provides some protection from disturbance and terrestrial predation. High densities of California horn snail (*Cerithideopsis californica*) were observed in some of the tidal ponds during the reconnaissance survey (Baye, 2021). Willet (*Tringa semipalmata*) and yellowlegs (*Tringa* sp.), were observed foraging within a tidal pond during the reconnaissance survey.

Non-Tidal Channel

Along the east side of the levee there is a non-tidal slough connected to Bockman Channel with a tidal flap gate water control structure to the north and goes under the railroad tracks to the east of the site where it connects to an Alameda County Flood Control District culvert (Photo 7 in Appendix A). A portion of this channel is open water, while the remaining area is vegetated. It's possible some brackish water potentially enters the channel from Bockman Channel, but overall this non-tidal channel is expected to be fairly fresh. This channel has potential to provide habitat for a wide range of bird species and other common wildlife.

3.2 Sensitive Natural Communities

Natural Communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. Sensitive natural communities are designated by various resource agencies, such as CDFW, or in local policies and regulations, and are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution, and are considered threatened enough to warrant some level of protection. CDFW tracks communities it believes to be of conservation concern through its *California Sensitive Natural Community List*, which is consistent with the Manual of California Vegetation mapping standards (CDFW, 2019; Sawyer et al., 2009). Only those Natural Communities with a rarity ranking of 1 to 3, as well as communities considered sensitive as marked with a 'Y' on the *California Sensitive Natural Community List*, are considered sensitive.

The tidal marsh, which is primarily dominated by pickleweed would be classified by the MCV as *Sarcocornia pacifica* Herbaceous Alliance or pickleweed mats. The low tidal marsh areas are

often dominated by California cordgrass which corresponds to the California Cordgrass Marsh Alliance. Native grassland is dominated by creeping wild rye which is classified as Creeping Ryegrass Turfs or the *Elymus cinereus* – *Elymus triticoides* Herbaceous Alliance. The Pickleweed Mat Alliance, California Cordgrass Marsh Alliance, and Creeping Ryegrass Turfs Alliance all have a State Rarity Ranking of S3.

Two Habitat Areas of Particular Concern (HAPC), considered by NMFS as habitats of particular ecological importance are protected. Within San Francisco Bay the two protected HAPC are eelgrass (*Zostera marina*) and Olympia oyster (*Ostrea lurida*) beds. However, neither eelgrass nor Olympia oyster beds are expected to be present within the study area (Merkel et al. 2014; Wasson et al. 2014).

3.3 Potential Waters of the U.S and State

Aquatic resources within the study area that have potential to be considered federally or state jurisdictional include all the aquatic habitat types described above in Section 3.1. However, the exact area and acreage of potentially jurisdictional waters will not be known until an aquatic resources delineation has been completed for the project. These aquatic habitat types (tidal salt marsh, non-tidal emergent wetland, seep, riparian, tidal channel, non-tidal channel, and tidal pond) are also shown in Figure 4.

3.4 Special-Status Species

A comprehensive list of special-status fish, wildlife and plant species that could occur in the Study Area was compiled to assess the likelihood of species occurrence (see **Appendix B**). Some of these receive specific protection defined in federal or state endangered species legislation. Others have been designated as “sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as “special-status species” in this report. Species with a moderate or high potential to occur in the Study Area are described below in greater detail.

3.4.1 Special-Status Plants

Database information indicates that many special-status plants have been documented in the vicinity of the Study Area, four of which were determined to have moderate likelihood to occur within the Study Area. Summaries of each of these four species is provided below. The remaining species were determined unlikely to occur based on lack of suitable specific habitat conditions (i.e., vernal pools), associated habitat communities are not present (i.e., chaparral), lack of suitable soil conditions, or because the Study Area is below the elevation range of the species.

Plants

Congdon’s tarplant (*Centromedia parryi* subsp. *congdonii*), a CRPR 1B.1 species, is an annual forb in the sunflower family (Asteraceae) that can have a wide blooming period between May to

November. It typically occurs in alkaline valley and foothill grasslands, but can also grow along roadsides at elevations below 755 feet. This species has been documented less than half a mile north of the Study Area in 2017 and approximately 2 miles to the south of the Study Area in 2009 (CDFW, 2021). Both of these recent nearby observations of Congdon's tarplant occurred in disturbed habitats with presence of weedy species. Non-native grassland and disturbed areas along the levees provide suitable habitat for this species within the Study Area.

3.4.2 Special-Status Fish and Wildlife

Special status wildlife species that have a moderate to high likelihood to occur within the Study Area are described below.

Fish

Central California Coast steelhead DPSs (*Oncorhynchus mykiss*). The Central California Coast (CCC) steelhead Distinct Population Segments (DPS) are listed as threatened under FESA. Steelhead possess the ability to spawn repeatedly, maintaining the mechanisms to return to the Pacific Ocean after spawning in freshwater. Juvenile steelhead may spend up to four years residing in freshwater prior to migrating to the ocean as smolts. CCC steelhead migrate through San Francisco Bay waters in transit between freshwater spawning areas and the Pacific Ocean, and may therefore occur seasonally in the waters of the Study Area. Historically, San Lorenzo Creek, just north of the study area, supported a significant steelhead run. However, channel modifications and changes in hydrology within the watershed have dramatically altered the fish community within the creek. Steelhead are still occasionally recorded within the upper reaches of San Lorenzo Creek; as such, they do have the potential to occur within the vicinity of the Study Area (Leidy et al. 2005).

Longfin smelt (*Spirinchus thaleichthys*), a federal candidate for listing, state-listed threatened species, is a small schooling fish that inhabits the freshwater section of the lower Delta and has been observed from south San Francisco Bay to the Delta, with the bulk of the San Francisco Bay population occupying the region between the Carquinez Straight and the Delta. In the fall, adults from San Francisco and San Pablo Bays migrate to fresher water in the Delta to spawn. The larvae are pelagic and found in the upper layers of the water column. Longfin smelt are harvested commercially and sold in local markets. Longfin smelt are known to be seasonally present in San Francisco Bay and could stray into the Study Area.

Birds

California Ridgway's rail (*Rallus obsoletus obsoletus*). The California Ridgway's rail (formerly known as the California clapper rail) is a federally endangered, state endangered, and California fully protected species. California Ridgway's rail is the resident rail subspecies of northern and central California, and is currently restricted to the San Francisco Bay Estuary, with the largest populations occurring in remnant salt marshes of south San Francisco Bay. The California Ridgway's rail occurs only within salt and brackish marshes. In south and central San Francisco Bay, California Ridgway's rail typically inhabits salt marshes dominated by pickleweed and cordgrass. Breeding occurs from mid-March through July, with peak activity in late April to late May.

The California Ridgway's rail is a secretive, hen-like waterbird, that lives in salt and brackish tidal marshes in the San Francisco Bay. This species once occupied coastal California tidal marshes from Humboldt Bay southward to Morro Bay, and estuarine marshes of San Francisco Bay and San Pablo Bay to the Carquinez Strait (Raabe et al., 2010). Resident populations are currently limited to San Francisco Bay, San Pablo Bay, Suisun Bay, and associated tidal marshes.

California Ridgway's rail occur almost exclusively in tidal salt and brackish marshes with unrestricted daily tidal flows, adequate invertebrate prey food supply, well developed tidal channel networks, and suitable nesting and escape cover during extreme high tides (Raabe et al., 2010). California Ridgway's rail depend on mudflats or very shallow water within a network of tidal channels where there are both abundant invertebrate populations and taller plant material to provide cover, refuge during high tides, nesting opportunities above high tides and wave action, and protection from predators. California Ridgway's rail rely on marsh plants such as Pacific cordgrass, bulrush (*Bolboschoenus maritimus*), and pickleweed for breeding and feeding. They feed mostly under or near vegetation, which shelter many of the food items rails depend on, such as crustaceans, bivalves, and insects.

Annual rail surveys have continued within Oro Loma Marsh and other nearby tidal marshes since 2005. Annual surveys from 2005 through 2016 detected California Ridgway's rail in Oro Loma East, except for 2006 when it was determined the site was inadequately surveyed (OEI 2008a, 2008b, 2009, 2011a, 2011b, 2012, 2013, 2014, 2015, 2016). California Ridgway's rail hasn't been detected in Oro Loma East in 2017 through 2020, but the species was detected in Oro Loma West in those same years (OEI 2018a, 2018b, 2020, 2021). The relative density of California Ridgway's rail at Oro Loma Marsh has consistently remained low during these annual survey events, while nearby marshes have detected much higher relative densities. Citation Marsh and other surrounding marshes, less than 2 miles to the North, and Cogswell Marsh, less than 2 miles to the south, have consistently contained higher densities of California Ridgway's rail (OEI, 2008-2021).

The Study Area provides suitable habitat for the California Ridgway's rail and the species has consistently been detected in low numbers within the Study Area or just outside the Study Area annually for the past 16 years.

California black rail (*Laterallus jamaicensis coturniculus*). Potential breeding habitat for California black rail (state threatened species and California fully protected species) exists in the tidal marsh habitat in the Study Area. This species lives in coastal salt and brackish marshes. Year-round residents, these species stay mainly in the upper to lower zones of coastal marshes that are dominated by pickleweed. Threats to this species include lost and degradation of salt marsh habitat, encroachment of human activities, genetic isolation due to habitat fragmentation, and predation from coyotes, raptors, possibly river otters, raccoons, and feral cats.

California black rail has not been detected within Oro Loma Marsh during recent annual rail surveys (OEI 2018a, 2018b, 2020, 2021). California black rails also have not been observed during annual surveys in other marshes in the larger Hayward region in 2017 through 2019. However, during 2020 surveys two black rails were detected within two miles of the Study Area

within Citation Marsh to the north and Cogswell Marsh to the south. California black rails have been observed in marshes less than two miles to the south of the Study Area near Hayward and Johnson landings and Cogswell Marsh, including two occurrences in 2007 and 2012 (CDFW, 2021). Although California black rails have not been detected in the Study Area, this species could still have potential to occur due to the presence of suitable habitat and nearby occurrences.

Northern harrier (*Circus cyaneus*). This species, like other raptors and birds in general, is protected under California Code 3503 and 3503.5, which prohibits the taking or destroying of any bird or nest in the order of Falconiformes (falcons, kites, and hawks) and Strigiformes (owls). It is also a California species of special concern. Northern harrier nest and forage along wet meadows, slough, savanna, prairie, and marshes, feeding on small mammals, such as California vole and mice. The territory for this species is often a minimum of 10-20 acres of foraging area. Destruction of marsh habitat is the primary reason for the decline of this species. Northern harrier potential suitable nesting habitat occurs within the Study Area and the species was observed flying over the Study Area during the reconnaissance survey.

Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*) is a California species of special concern due to major decline of both habitat and populations in the past decade. The common yellowthroat is a small warbler with a complex of subspecies. The salt marsh subspecies is recognized as a distinct breeding population, with geographic distribution, habitats, and subtle differences in morphological traits that distinguish it from other subspecies. It inhabits tidal salt and brackish marshes in winter, but breeds in freshwater to brackish marshes and riparian woodlands during spring to early summer (Shuford and Gardali, 2008). Nests are placed on or near the ground in dense emergent vegetation or shrubs. Saltmarsh common yellowthroat has potential to occur within the Study Area due to the presence of suitable habitat and the geographical range of the species.

Alameda song sparrow (*Melospiza melodia pusillula*) is a California species of special concern and one of three morphologically distinct song sparrow subspecies that occur in the San Francisco Bay region. This particular subspecies is endemic to the salt marshes of eastern and south San Francisco Bay. Alameda Song Sparrows require some upper marsh vegetation for nesting, so that nests remain dry during all but the highest tides. The dense and tall vegetation within the Study Area provides suitable nesting and foraging habitat for this species and the species was observed during the reconnaissance-level survey.

White-tailed kite (*Elanus leucurus*) is a California fully protected species and is typically found in open grassland, river valleys, and marshes. They are often found along tree-lined river valleys with adjacent open areas, but are not usually found in forests or in clear-cuts within forests. Nesting starts in January and are usually built atop of a tree, 20 to 50 feet off the ground. Scattered trees are needed for nesting and perching. The Study Area is predominantly tidal marsh but provides some willow trees in the southeast corner and many trees just to the east of the Study Area. White-tailed kite has potential to occur within the Study Area due to the presence of nearby trees and suitable foraging habitat within the Study Area.

Burrowing Owl (*Athene cunicularia*), a California species of special concern, is a small, ground-nesting bird that is predominantly nocturnal but is also active during the day. Burrowing owls are found in a variety of habitats that include annual grasslands with mammal burrows. Burrowing owls require low vegetative cover and adequate perch sites to forage from and to act as lookout points for predators. Burrowing owls also require level to gently sloping areas (Haug et al., 1993; Dechant et al., 2003). Specifically, breeding habitat includes annual grasslands, shortgrass prairie, pastures, hayfields, and fallow fields (Dechant et al., 2003). Burrowing owls also occur in a variety of urban and agricultural habitats that include areas adjacent to roads and railroads, irrigation ditches, golf courses, airports, university campuses, and vacant dirt lots where grasses are regularly mowed (Coulombe, 1971; Thomsen, 1971; Collins and Landry, 1977; Trulio, 1995; and Dechant et al., 2003).

Burrow availability is a major factor in defining suitable burrowing owl habitat (Coulombe, 1971; Green and Anthony, 1989). Most importantly, western burrowing owls require the presence of a mammal burrow or cavity (natural or man-made) that is the appropriate size for a nest burrow. Although western burrowing owls can excavate holes where burrowing mammals are absent, they rarely do so (Thomsen, 1971). Throughout California, western burrowing owls primarily use California ground squirrel burrows. Burrowing owls also use man-made cavities for nest burrows. Examples include pipes, culverts, rock piles, concrete debris, and artificial burrows.

Burrowing owls are year-round residents within much of California (Shuford and Gardali, 2008). Relatively little is known about migration routes, times, and wintering areas (Haug et al., 1993). However, observations indicate that populations of the western burrowing owl in the northernmost and highest-elevation portions of the species' range are migratory. The migratory individuals leave their breeding grounds in the fall, around September or October, and return to the same or nearby burrows each spring, around March or April (Center for Biological Diversity, 2003; Klute et al., 2003).

Burrowing owl mounds were created at the edges and within the tidal marsh habitat during the site restoration in the late 1990's. No occupancy of those mounds by burrowing owl has been documented since their creation. There is one CNDDDB occurrence of burrowing owl within the Study Area in the northeast corner of the site in 1991. That occurrence was within non-native annual grasses mixed with low quality seasonal wetlands primarily composed of pickleweed. The occurrence location documented overlaps with an area that has been enhanced in 2000 and is now known as the Port of Oakland Mitigation Marsh within the larger Oro Loma Marsh and is tidal marsh habitat with non-native grasses along the edges of the levees. However, potential habitat still occurs within the Study Area especially within the southeast corner of the Study Area in areas where there is grassland habitat and California ground squirrel burrows. Due to the past occurrence of burrowing owl within the Study Area and suitable habitat present there is potential for the species to occur within the Study Area.

Mammals

Salt marsh harvest mouse (*Reithrodontomys raviventris*) (SMHM) are small, native rodents that are endemic to the salt marshes and adjacent diked wetlands of San Francisco Bay. SMHM are listed as federally and state endangered species. This species is considered a California fully

protected species. Suitable habitat for SMHM is present in the tidal marshes of the Study Area. It is anticipated salt marsh harvest mouse will occupy suitable pickleweed and marsh habitats within the Study Area.

The SMHM is endemic to the marshes which border San Francisco, San Pablo, and Suisun Bays. There are two subspecies of SMHM: the northern subspecies (*Reithrodontomys raviventris halicoetes*) is found in the Marin Peninsula and San Pablo and Suisun Bays (Shellhammer, 2000). The southern (*R. r. raviventris*) lives in the marshes of Corte Madera, Richmond and South San Francisco Bay (Shellhammer, 2000). Occurrence of both subspecies within this small range is highly fragmented.

The primary habitat of the SMHM is the middle to upper zone of salt and brackish marshes. The SMHM is dependent on dense vegetation cover, usually in the form of pickleweed (*Salicornia pacifica*, the dominant salt marsh vegetation in the Bay) and other salt dependent or salt tolerant vegetation. Optimal SMHM habitat has dense vegetative cover, with a high percentage cover of pickleweed, and has contiguous dense and tall cover in which the mice can escape extreme water levels without excessive exposure to predation. SMHM may also move into grasslands adjacent to marshes during extreme high tides if dense cover is present. The mouse is largely herbivorous with pickleweed known to be its primary food source. Loss of habitat due to the diking and filling of wetlands has been the major factor contributing to the decline of the SMHM.

Small mammal trapping occurred in Oro Loma Marsh in 2009 within tidal marsh. SMHM were captured during these trapping events in areas dominated by pickleweed with alkali heath and marsh grindelia also present (Reinshe, 2009). Twenty-six salt marsh harvest mouse were captured as well as 51 house mouse (*Mus musculus*). Most of the mice were captured at the trap lines placed by the Sulphur Creek channel southwest of the study area. Only two SMHM were captured within the study area at the trap lines which were set on the east side of the marsh within the study area (Reinsche, 2009).

Four small mammal trapping events have also occurred in Oro Loma Marsh between 1985 and 1993 (Shellhammer and SFEI, 2005). Three of those trapping events captured at least one SMHM. Multiple trapping events at other tidal and diked marshes within two miles, to the north and south of the study area, captured SMHM between 1982 and 2000 (Shellhammer and SFEI, 2005). CNDDDB captures some of these SMHM occurrences within the Study Area and surrounding area (CDFW, 2021).

Densely vegetated areas dominated by pickleweed within and just outside the Study Area provide potential high quality habitat for SMHM. Marsh gumplant within these habitats also provides important high tide refugia habitat. These high quality habitats occur within the mid and high tidal marsh and transition zone within the Study Area.

Salt marsh wandering shrew (*Sorex vagrans halicoetes*) is considered a species of special concern and occurs within the central and south San Francisco Bay. It occurs in salt marsh communities along the southern parts of San Francisco Bay. In general, salt marsh shrews prefer areas of salt marsh with dense cover and mid to high marsh habitat about 6 to 8 feet above sea

level, which provide adequate cover and nesting places along with plentiful supply of invertebrates (CDFG 1998).

The closest CNDDDB occurrence was observed approximately 1.5 miles south of the Study Area in the tidal and diked salt marsh around Johnson and Hayward landings in 1951. A trapping event occurred at the same marsh in 1983, but no shrews were captured. Although suitable habitat occurs within the Study Area, there are no known nearby recent occurrences. There are two other CNDDDB occurrences within 5 miles of the Study Area. One occurrence was at the Oakland airport to the north from 1950 in diked salt marsh. The other occurrence was from 1985 in tidal marsh near the mouth of Alameda Creek to the south of the Study Area. This species could occur in the Study Area, given the suitable habitat present and geographical range of the species.

Hoary bat (*Lasiurus cinereus*) has potential to occur within the Study Area and has a medium priority ranking from the Western Bat Working Group. Hoary bat has a widespread distribution throughout North America and Hawaii as well as parts of South America. Hoary bat prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Hoary bats are solitary rooster in dense foliage of medium to large trees. There is one historic CNDDDB occurrence of the species 2 miles east of the Study Area. The riparian trees within the Study Area provide marginal roosting habitat for hoary bat, while the seasonal wetlands, tidal marsh, tidal channel, and ponds provide open foraging habitat.

3.5 Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization can fragment or separate large open-space areas. The fragmentation of natural habitat can create isolated “islands” of vegetation and habitat that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. The retention of wildlife movement corridors ameliorates the effects of such fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished. Such movement may also promote genetic exchange between separated populations.

The area is not recognized as being within a major or local wildlife corridor/travel route according to the CDFW’s Essential Habitat Connectivity natural landscape blocks (CDFW, 2017). The Study Area is connected to San Francisco Bay, but has limited upland connectivity opportunity since the Study Area is surrounded by developed commercial and residential areas. The Eden Landing Ecological Reserve is the nearest natural landscape block to the Study Area and is approximately 2.5 miles to the south and is just south of State Route 92 (CDFW, 2017).

The Study Area is designated by CDFW as Areas of Conservation Emphasis (ACE) Rank 3 lands. ACE ranks occur from 1 to 5, so a relative score of 3 shows a moderate area of conservation emphasis compared to all other areas across California.

3.6 Critical Habitat for Listed Fish and Wildlife Species

Critical habitat is a term defined in the FESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The FESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery. In many cases, this level of protection is similar to that already provided to species by the FESA jeopardy standard. However, areas that are currently unoccupied by the species but which are needed for the species' recovery are protected by the prohibition against adverse modification of critical habitat. There is no USFWS designated critical habitat for listed wildlife within the Study Area (USFWS, 2021).

Open water habitat of San Francisco Bay is designated as critical habitat for five federally protected fish species. These include the Federally threatened Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), central California coast steelhead (*Oncorhynchus mykiss*) Evolutionary Significant Unit (ESU), California Central Valley steelhead (*O. mykiss*) ESU, Central Valley spring-run Chinook salmon (*O. tshawytscha*), and the Federally endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*). The National Marine Fisheries Services (NMFS) designated critical habitat for Sacramento winter-run Chinook salmon on June 16, 1993 (NMFS, 1993), Central Valley spring-run Chinook salmon, central California coast steelhead, and California Central Valley steelhead, on September 2, 2005 (NMFS, 2005) and for green sturgeon on October 9, 2009 (NMFS, 2009).

3.6.1 Federal Essential Fish Habitat

The Sustainable Fisheries Act of 1996 (Public Law 104-297), amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for Essential Fish Habitat (EFH) descriptions in federal Fisheries Management Plans (FMPs) and to require federal agencies to consult with the NMFS on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all fishery management councils to amend their FMPs to describe and identify EFH for each managed fishery. The Act also requires consultation for all federal agency actions that may adversely affect EFH (i.e., direct versus indirect effects); it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of the activity's location. Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless state or private actions require a federal permit or receive federal funding.

Although the concept of EFH is similar to that of critical habitat under the FESA, measures recommended to protect EFH by NMFS are advisory, not proscriptive.

The bay waters adjacent to the Study Area fall within EFH for multiple species of commercially important fish managed under three federal fisheries management plans (FMPs):

Coastal Pelagic EFH: The Coastal Pelagic FMP is designed to protect habitat for a variety of fish species that are associated with open coastal waters. Fish managed under this plan include planktivores and their predators. Those commonly found in San Francisco Bay include Northern anchovy and Pacific sardine.

Pacific Groundfish EFH: The Pacific Groundfish FMP is designed to protect habitat for more than 90 species of fish, including rockfish, flatfish, roundfish, some sharks and skates, and other species that associate with the underwater substrate. Multiple species are reported in recent years as present in San Pablo and Suisun Bay waters, including English sole and starry flounder.

Pacific Salmon EFH: The Pacific Salmon FMP is designed to protect habitat for commercially important salmonid species.

Both the Sacramento River winter-run Chinook salmon and Central Valley spring-run are unlikely to occur within the Study Area or immediate vicinity, as the Sacramento River and its tributaries represent the only spawning and rearing habitat for both of these runs (Moyle 2002). Individuals could only occur within the vicinity of the Study Area during migratory periods to and from San Francisco Bay; however, Chinook from these runs typically spend little time foraging in this portion of the bay. Tagging and monitoring studies have shown that Chinook usually take a direct route from the Delta to the Central Bay, and then out to the Pacific Ocean (Hearn et al. 2010).

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CHAPTER 4

References and Report Preparation

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Appendix A

Representative Photographs



EBDA First Mile Horizontal Levee Project

Photo 1
Non-native grassland on the left and taller ruderal vegetation on the right in the southeast corner of the Study Area.



EBDA First Mile Horizontal Levee Project

Photo 2
Patch of native grassland (creeping wild rye) within the southeast corner of the Study Area.



EBDA First Mile Horizontal Levee Project

Photo 3

A small area of riparian habitat (willow trees) occurs along the east side of the Study Area east of the levee.



EBDA First Mile Horizontal Levee Project

Photo 4

Tidal Marsh and portion of tidal pond from the looking west over the Study Area



EBDA First Mile Horizontal Levee Project

Photo 5
Non-tidal emergent marsh dominated by cattails within the drainage channel between the levee and the railroad tracks.



EBDA First Mile Horizontal Levee Project

Photo 6
Tidal channel within Oro Loma Marsh



EBDA First Mile Horizontal Levee Project

Photo 6

Non-tidal drainage channel between the levee and the railroad tracks.

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Appendix B

Special Status Fish, Wildlife, and Plant Species with Potential to Occur in the EBDA First Mile Horizontal Levee Project

TABLE 1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Amphibians			
California tiger salamander (<i>Ambystoma californiense</i>)	FT/ST	Grasslands and low foothills with pools or ponds for breeding, typically vernal pools are ideal for natural breeding	Not Expected. Site is out of the species' range and provides no habitat. Closest CNDDDB occurrence is 16 miles northwest of the Study Area.
California red-legged frog (<i>Rana draytonii</i>)	FT/SSC	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow moving streams and needs pools of >0.5 m depth for breeding.	Low. Study Area aquatic conditions are too saline for this species. Closest CNDDDB occurrence is over 20 miles away from the Study Area.
Foothill yellow-legged frog (<i>Rana boylei</i>)	--/SSC	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats; requires at least some cobble-sized substrate for egg-laying.	Low. Suitable habitat lacking in the Study Area. CNDDDB occurrence approximately 6 miles east of the Study Area from 1960 (occurrence # 2344), east of Study Area, has been possibly extirpated.
Reptiles			
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT/CT	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats.	Not Expected. Study Area does not provide suitable habitat.
San Francisco gartersnake (<i>Thamnophis sirtalis tetrataenia</i>)	FE/SE	Vicinity of freshwater marshes, ponds, and slow-moving streams in San Mateo County and extreme northern Santa Cruz County.	Not Expected. Study Area does not provide suitable habitat.
Western pond turtle (<i>Actinemys marmorata</i>)	--/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation <6,000' in elevation. Require basking area and upland habitat for egg laying (sandy banks and open, grassy fields)	Low. Study Area does not provide suitable freshwater pond or basking habitat. A non-tidal channel occurs within the site, but had steep edges and no basking areas. There are also no CNDDDB occurrences within 5 miles of the Study Area.
Birds			
Short-eared owl (<i>Asio flammeus</i>)	--/SSC (Nesting only)	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Low (nesting). Study Area contains suitable winter foraging habitat, but lacks meadow and tall grasses needed for suitable nesting habitat. Closest CNDDDB occurrence is over 20 miles southwest of the Study Area and across the San Francisco Bay.
Burrowing owl (<i>Athene cucularia</i>)	--/SSC (Burrowing sites & some wintering sites)	Nests and forages in low-growing grasslands with burrowing mammals.	Moderate. Study Area contains mounds and structures at the edges of the marsh and some low-growing grassland habitat which could provide suitable nesting or burrowing habitat. Closest CNDDDB occurrence is located in the northeastern corner of the Study Area from 1991 (occurrence # 164).
Golden eagle (<i>Aquila chrysaetos</i>)	BCC/CFP	Rolling foothills, mountain areas, sage-juniper flats, and desert.	Low. Study Area does not contain suitable habitat. Closest CNDDDB occurrence is approximately 15 miles east in the foothills (occurrence #55).

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	FT/SSC (Nesting only)	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	Low. Study Area does not provide suitable nesting habitat. There are 3 CNDDDB occurrences within 5 miles of the Study Area. The closest occurrence was reported in 2009 approximately 3 miles south (occurrence #122). The second closest is approximately 4 miles south of the Study Area in 2017 (occurrence # 136). The furthest CNDDDB occurrence is approximately 10 miles northwest of the Study Area reported in 1979 (occurrence #90)
Northern harrier (<i>Circus cyaneus</i>)	--/SSC (Nesting only)	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Moderate (nesting). Suitable nesting habitat within the southeastern portion of Study Area and suitable foraging habitat within the tidal marsh. Closest CNDDDB occurrence is 3 miles south of the Study Area in 2004 (occurrence #32)
Yellow rail (<i>Coturnicops noveboracensis</i>)	BCC/SSC	Requires freshwater marshlands.	Low. Study Area is too saline to provide suitable habitat for this species.
White-tailed kite (<i>Elanus leucurus</i>)	--/CFP (Nesting only)	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	Moderate (nesting). Study Area provides suitable foraging and there is nesting habitat in close proximity.
American peregrine falcon (<i>Falco peregrinus anatum</i>)	BCC/CFP	Forages near wetlands, ales, rivers, or other waters. Nests on cliffs, banks, dunes, mounds, or human-made structures consisting of a scrape or depression/ledge in an open site.	Low. Study Area could provide marginal suitable foraging habitat but does not support substantial nesting habitat.
Salt-marsh common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	BCC/SSC	In brackish and saline tidal marsh habitat around San Francisco Bay, associated with a high percent cover of bulrushes, perennial pepperweed, and rushes.	Moderate. Tidal salt marsh in Study Area provides suitable habitat. Closest CNDDDB occurrence was approximately 5 miles southeast of the Study Area in 1976 (occurrence #7).
California black rail (<i>Laterallus jamaicensis</i>)	BCC/ST/CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	Moderate. Tidal salt marsh in Study Area provides marginal habitat for this species. Closest CNDDDB occurrences are approximately 0.15-mile and 0.20-mile south of the Study Area in 2003 and 2007 (occurrences #110 and #219, respectively). According to the Invasive <i>Spartina</i> project 2019 east bay map, no black rails were identified within the Study Area or within a 5-mile radius.
Yellow warbler (<i>Setophaga petechia</i>)	BCC/SSC	Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Low. Study Area does not provide suitable riparian habitat for nesting.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Bank swallow (<i>Riparia riparia</i>)	--/ST (Nesting only)	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Low. Suitable nesting habitat not found in the Study Area.
Black skimmer (<i>Rynchops niger</i>)	BCC/SSC	Nests on gravel bars, low islets, and sandy beaches, in unvegetated sites. Nesting colonies usually less than 200 pairs.	Low. Study Area does not provide suitable nesting habitat.
Alameda song sparrow (<i>Melospiza melodia pusillula</i>)	BCC/SSC	Salt marshes. Inhabits pickleweed marshes; nests low in gumplant bushes (high enough to escape high tides) and in pickleweed.	Present. Study Area contains suitable tidal salt marsh habitat. CNDDDB occurrence located within the Study Area in 1939 (occurrence #19). Additional CNDDDB occurrences occurred within 2004 approximately 3 miles away (occurrence #4, #5, and #8).
California Ridgway's rail [California clapper rail] (<i>Rallus obsoletus obsoletus</i>)	FE/SE/CFP	Found in salt and brackish marsh with well-defined tidal channels and dense growth of pickleweed; feeds on invertebrates in mud-bottomed sloughs.	High. Suitable foraging and nesting habitat. Known to breed in tidal marshes and observed on the western coastline of Oro Loma marsh in 2019. CNDDDB occurrences have also reported the presence of Ridgway's within the Study Area in 2006 (occurrence #107).
Tricolored blackbird (<i>Agelaius tricolor</i>)	--/ST/SSC (Nesting colony only)	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony. Forages in grassland and cropland. Nests in cattails, tules, and blackberries large enough for at least 50 nesting pairs.	Low. The Study Area does not provide foraging habitat or a large enough substrate for a nesting colony.
California least tern (<i>Sternula antillarum browni</i>)	FE/SE (Nesting colony only)	Nest on beaches, mudflats, and sand dunes, usually near shallow estuaries and lagoons with access to open ocean.	Low. Suitable beach and dune habitat is not present in the Study Area.
Fish			
Longfin smelt (<i>Spirinchus thaleichthys</i>)	FC/CT	Occur in the middle or bottom of water column in salt or brackish water portions of the San Francisco Bay-Delta. Concentrated in Suisun, San Pablo, and North San Francisco Bays.	Moderate. Present in San Pablo Bay and may occasionally occur in the tidal portions of the Study Area.
Tidewater goby (<i>Eucyclogobius newberryi</i>)	FE/SSC	Found in shallow coastal lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels	Not Expected. Extirpated from San Francisco Bay.
Steelhead – Central California Coast DPS (<i>Oncorhynchus mykiss</i>)	FT/--	Requires cold, freshwater streams with suitable gravel for spawning. Rears in rivers and tributaries to the San Francisco Bay.	Moderate. Novato Creek watershed supports rearing and spawning habitat for steelhead. Steelhead have been observed during fish relocation within Novato Creek in 2016 and 2020.
Invertebrates			
Crotch bumble bee (<i>Bombus crotchii</i>)	--/SE	Inhabits grassland and scrub areas, generally requires a hotter and drier environment. Historically ranging across southern California, from the coast and coastal ranges, through the Central Valley, and to the adjacent foothills.	Low. Study Area does not provide sufficient grassland or scrubland habitat.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Western bumble bee (<i>Bombus occidentalis</i>)	FC/SE	Found in any area with sufficient flowers for nutrition, and underground burrows, mostly restricted to high elevation sites in the Sierra Nevada.	Low. Limited flowering plants present in the developed area surrounding the Study Area. One historic occurrence within the City of Novato (CNDDDB occurrence #189) in 1926.
Bay checkerspot butterfly (<i>Euphydryas editha bayensis</i>)	FT/---	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay.	Low. Study Area does not provide sufficient grasslands or outcrops to support this species.
Myrtle's silverspot butterfly (<i>Speyeria zerene myrtleae</i>)	FE/---	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula, extirpated from coastal San Mateo County.	Not Expected. The Study Area does not provide suitable habitat.
Mammals			
Alameda Island mole (<i>Scapanus latimanus parvus</i>)	SSC/---	Only known from Alameda Island. Found in a variety of habitats, especially annual and perennial grasslands.	Not Expected. Range of this species is not within the Study Area.
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	SSC/WBWG	Requires high cliffs or rocky outcrops for roosting sites.	Not Expected. Study Area does not provide suitable nesting habitat and is not known to occur near the Study Area.
Pallid bat (<i>Antrozous pallidus</i>)	-- /SSC/WBWG High	Grasslands, shrublands, woodlands, and forests. Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges. Very sensitive to disturbance.	Low. The Study Area provides marginal suitable foraging habitat in the southeastern portion of the Study Area, but no suitable roosting habitat occurs within the Study Area. Closest CNDDDB occurrence is approximately 2.4 miles southeast of the Study Area in 1932.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	--/SSC/ WBWG High	Herbaceous, shrub, and open stages of most habitats with dry, friable soils. Roost in caves, mines, tunnels with minimal disturbance but can also be found in abandoned open buildings or other human made structures.	Low. The southeastern portion of the Study Area provides marginal suitable herbaceous foraging habitat, but no known potential roosting habitat within the Study Area.
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	--/--/WBWB Medium	Forest and woodland habitats near bodies of water, such as rivers, lakes, streams, estuaries or ponds. Solitary rooster behind tree bark, but have been found in buildings, mines, woodpecker holes, and birds' nests.	Low. The southeastern portion of the Study Area provides marginal suitable herbaceous foraging habitat, but no known potential roosting habitat within the Study Area.
Hoary bat (<i>Lasiurus cinereus</i>)	--/--/ WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Solitary rooster in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Moderate. The southeastern portion of the Study Area provides marginal tree cover and foliage for roosting. Closest CNDDDB occurrence is approximately 2 miles east of the Study Area in 1920 (occurrence # 14).
Western mastiff bat (<i>Eumops perotis californicus</i>)	SSC/WBWG	Open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Known to roost on cliff-face crevices and needing large ponds for drinking water.	Low. Study Area lacks suitable habitat. Closest CNDDDB occurrence is from 1890 approximately 2 miles east of the Study Area (occurrence #159)
Salt marsh harvest mouse (<i>Reithrodontomys raviventris</i>)	FE/SE/CFP	Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow, builds loosely organized nests. Requires higher areas for flood escape.	High. Suitable tidal salt marsh and diked seasonal wetland habitat within the Study Area. Historical captures of this species have occurred in 1990 (40 captures) and 1985 (1 capture)

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
			located within the Study Area. CNNDDB occurrence has also been reported within the Study Area in 1985 (occurrence #117).
Salt marsh wandering shrew (<i>Sorex vagrans halicoetes</i>)	--/SSC	Marsh and wetlands. Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among pickleweed	Moderate. Study Area provides suitable tidal marsh and wetland habitat. Closest CNDDDB occurrence is approximately 0.5 miles south of the Study Area in 1951 (occurrence # 14).
San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>)	--/SSC	Forest habitats of moderate canopy and moderate to dense understory. Also prefers chaparral and redwood habitats. Limited by nest building materials (i.e. shredded grass, leaves, sticks, and other materials).	Low. Study Area does not provide substantial forest habitat or dense understory to support nesting.
American badger (<i>Taxidea taxus</i>)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	Low. No suitable open, dry habitat in the Study Area.
Plants			
San Mateo thorn-mint (<i>Acanthomintha duttonii</i>)	FE/SE/1B.1	Cismontane woodland, valley and foothill grassland, coastal bluff scrub. Blooms April – June. Elevation ranges from 50 -185m.	Not Expected. Species range is restricted to San Mateo coastal range.
Franciscan onion (<i>Allium peninsulare</i> var. <i>franciscanum</i>)	--/--/1B.2	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine; sometimes on volcanics. Dry hillsides. Elevation ranges from 5 - 320 meters.	Low. Non-native, annual grassland provides suitable habitat. Nearest recent CNDDDB occurrence is 11 miles away from Study Area in San Mateo (occurrence #7).
Bent-flowered fiddleneck (<i>Amsinckia lunaris</i>)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub. Blooms March – June. Elevation up to 500 meters.	Low. Non-native, annual grassland provides suitable habitat. Nearest recent CNDDDB occurrence is approximately 7.5 mi away (occurrence #72).
Montara manzanita (<i>Arctostaphylos montaraensis</i>)	--/--/1B.2	Chaparral, coastal scrub. Blooms Jan. – March. Elevation 80-50 meters.	Not expected. Study Area does not support chaparral habitat.
Pallid manzanita (<i>Arctostaphylos pallida</i>)	FT/SE/1B.1	Broad-leafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub. Blooms December – March. Elevation ranges up to 180 – 460 meters.	Not Expected. Study Area does not support substantial forest or woodland habitat.
Coastal marsh milk-vetch (<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>)	--/--/1B.2	Coastal marshes, seeps, and adjacent sand. Blooms June – September. Elevation up to 150 meters.	Not Expected. No documented occurrences within the East Bay.
Alkali milk-vetch (<i>Astragalus tener</i> var. <i>tener</i>)	--/--/1B.2	Alkaline flats, vernal moist meadows. Blooms March – June. Elevation up to 60 meters.	Not Expected. Presumed extirpated from the East Bay.
big-scale balsamroot (<i>Balsamorhiza macrolepis</i>)	--/--/1B.2	Chaparral, valley and foothill grassland, cismontane woodland. Blooms March – June. Elevation 45 -145 meters.	Not expected. Study Area does not contain suitable habitat and is not within the species known elevation range.
Mt. Diablo fairy lantern (<i>Calochortus pulchellus</i>)	--/--/1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland. Blooms April – June. Elevation 200 – 800 meters.	Not expected. Study Area does not contain suitable habitat and is not within the species known elevation range.
Oakland star-tulip	--/--/4.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane	Not expected. Study Area does not contain suitable habitat and is not

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
<i>(Calochortus umbellatus)</i>		coniferous forest, valley and foothill grassland. Blooms March – May. Elevation 100 – 700 meters.	within the species known elevation range.
Johnny-nip <i>(Castilleja ambigua</i> var. <i>ambigua)</i>	--/--/4.2	Coastal bluffs and grasslands. Blooms March – Aug. Elevation 0 – 435 meters.	Low. Study Area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
bristly sedge <i>(Carex comosa)</i>	--/--/2B.1	Marshes and swamps, coastal prairie, valley and foothill grassland. Lake margins or wet places. Elevation below 400 meters. Blooms July – Sept.	Not Expected. No known occurrences within the East Bay and possibly extirpated from the San Francisco coast.
Congdon's tarplant <i>Centromadia parryi</i> subsp. <i>congdonii</i>	--/--/ 1B.1	Alkaline areas in valley and foothill grassland	High. May occur in disturbed grasslands on the Study Area. The closest known CNDDDB occurrence is approximately 0.2 miles north of the Study Area (occurrence #104).
Point Reyes bird's-beak <i>(Chloropyron maritimum</i> subsp. <i>palustre)</i>	--/--/1B.2	Coastal salt marsh. Blooms May – October. Elevation up to 10 meters.	Low. Study Area outside species' known range.
San Francisco Bay spineflower <i>(Chorizanthe cuspidata</i> var. <i>cuspidata)</i>	--/--/1B.2	Sandy or coastal dunes. Blooms April – July. Elevation up to 300 meters.	Not Expected. No suitable habitat within the Study Area.
Robust spineflower <i>(Chorizanthe robusta</i> var. <i>robusta)</i>	FE/--/1B.1	Cismontane woodland, coastal dunes, coastal scrub, chaparral. Blooms April – September. Elevation 5 – 245 meters.	Not Expected. No suitable habitat within the Study Area.
Crystal Springs fountain thistle <i>(Cirsium fontinale</i> var. <i>fontinale)</i>	FE/SE/1B.1	Valley and foothill grassland, chaparral, cismontane woodland, meadows and seeps. Blooms April – October. Elevation 45 -185.	Not Expected. No suitable habitat within the Study Area.
Santa Clara red ribbons <i>(Clarkia concinna</i> subsp. <i>automixa)</i>	--/--/4.3	Cismontane woodland, chaparral. Blooms April – July. Elevation 90 – 1500 meters.	Not Expected. No suitable habitat within the Study Area.
Presidio clarkia <i>(Clarkia franciscana)</i>	FE/SE/1B.1	Coastal scrub, valley and foothill grassland. Blooms May – July. Elevation 20-305 meters.	Not Expected. No suitable habitat within the Study Area.
San Francisco collinsia <i>(Collinsia multicolor)</i>	--/--/1B.2	Closed-cone coniferous forest, coastal scrub. Blooms Feb. – May. Elevation 10 – 275 meters.	Not Expected. No suitable habitat within the Study Area.
Western leatherwood <i>(Dirca occidentalis)</i>	--/--/1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie. Blooms Jan. – April. Elevation 60 - 640 meters.	Not Expected. No suitable habitat within the Study Area.
California bottle-brush grass <i>(Elymus californicus)</i>	--/--/4.3	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland. Blooms May – Aug. Elevation 15 – 470 meters.	Not expected. Study area outside species' known range.
Tiburon buckwheat <i>(Eriogonum luteolum</i> var. <i>caninum)</i>	--/--/1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie. Blooms May – Sept. Elevation 60 – 640 meters.	Not Expected. No suitable habitat within the Study Area.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
San Mateo woolly sunflower (<i>Eriophyllum latilobum</i>)	FE/SE/1B.1	Cismontane woodland, coastal scrub, lower montane coniferous forest. Blooms May – June. Elevation 30 - 610 meters.	Not Expected. No suitable habitat within the Study Area.
Hoover's button-celery (<i>Eryngium aristulatum</i> var. <i>hooveri</i>)	--/--/1B.1	Alkaline depressions, vernal pools, roadside ditches and other wet places near the coast. Blooms June – August. Elevation 1-50 meters.	Low. Study Area provides suitable habitat but not known to occur within a 5-mile radius of the Study Area.
Jepson's coyote-thistle (<i>Eryngium jepsonii</i>)	--/--/1B.2	Vernal pools, valley and foothill grassland. Blooms April – August. Elevation 3 -305 meters	Low. Study Area provides marginal suitable habitat. Closest CNDDB occurrence is located 5.8 miles east of the Study Area (occurrence #5).
San Francisco wallflower (<i>Erysimum franciscanum</i>)	--/--/4.2	Chaparral, coastal dunes and scrub, valley and foothill grassland. Blooms March – June. Elevation 0 – 550 meters.	Not expected. Study Area outside species' known range.
San Joaquin spearscale (<i>Extriplex joaquinana</i>)	--/--/1B.2	Chenopod scrub, alkali meadow, playas, valley and foothill grassland. Blooms April – Oct. Elevation 0 – 800 meters.	Not Expected. No suitable habitat within the Study Area.
Hillsborough chocolate lily (<i>Fritillaria biflora</i> var. <i>ineziana</i>)	--/--/1B.1	Cismontane woodland, valley and foothill grassland. Most likely on serpentine. Blooms March – April. Elevation 90 – 170 meters.	Not Expected. No suitable habitat within the Study Area.
Fragrant fritillary (<i>Fritillaria liliacea</i>)	--/--/1B.2	Heavy soils on open hills and fields near the coast. Blooms from February - April. Elevation up to 400 meters.	Low. Study Area is within the species' historic range, but not within the extant range. Potential habitat for this species at the Study Area is limited in extent and was historically disturbed.
Blue coast gilia (<i>Gilia capitata</i> subsp. <i>chamissonis</i>)	--/--/1B.1	Coastal sand hills. Blooms April – June. Elevation up to 185 meters.	Not Expected. No nearby recent occurrences or suitable habitat within Study Area.
Dark-eyed gilia (<i>Gilia millefoliata</i>)	--/--/1B.2	Stabilized coastal dunes. Blooms March – July. Elevation up to 10 meters.	Not Expected. No suitable habitat present within Study Area.
Diablo helianthella (<i>Helianthella castanea</i>)	--/--/1B.2	Open, grassy areas. Blooms April – June. Elevation ranges from 60 – 1,300 meters.	Low. Study Area not within elevation range. Non-native grassland within Study Area provides marginal suitable habitat.
Congested-headed hayfield tarplant (<i>Hemizonia congesta</i> subsp. <i>congesta</i>)	--/--/1B.2	Grassy sites and marsh edges. Blooms April – November. Elevation up to 100 meters.	Low. Non-native grassland within Study Area provide marginal suitable habitat. No known or recent occurrences within or near the Study Area.
Short-leaved evax (<i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>)	--/--/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Blooms March – June. Elevation 0 – 640 meters.	Not Expected. No suitable habitat present within the Study Area.
Marin western flax (<i>Hesperolinon congestum</i>)	FT/ST/1B.1	Serpentine grassland. Blooms April – August. Elevation up to 200 meters.	Not Expected. No suitable habitat present within Study Area.
Water star-grass (<i>Heteranthera dubia</i>)	--/--/2B.2	Marshes and swamps. Alkaline, still or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Elevation 15- 1510 meters.	Low. Study Area provides marginal suitable habitat.
Loma Prieta hoita (<i>Hoita strobilina</i>)	--/--/1B.1	Chaparral, cismontane woodland, riparian woodland. Blooms May – July (Aug – Oct.) Elevation 60-975 meters.	Low. Study Area provides marginal suitable habitat.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Santa Cruz tarplant (<i>Holocarpha macradenia</i>)	FT/SE/1B.1	Clay soils in grassy areas. Blooms June – November. Elevation up to 200 meters.	Low. Non-native grassland in Study Area provides marginal suitable habitat. Nearest CNDDDB occurrence is possibly extirpated approximately 3 miles east (occurrence #15).
Kellogg's horkelia (<i>Horkelia cuneate</i> var. <i>sericea</i>)	--/1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Blooms April – Sept. Elevation 5 – 430 meters.	Not Expected. No suitable habitat present within Study Area.
Coast iris (<i>Iris longipetala</i>)	--/4.2	Moist, coastal prairie or open coastal forest. Blooms March – May. Elevation 0 – 600 meters.	Low. Study Area is within the species' range, but potential habitat for this species at the study area is limited in extent and of low quality.
Contra costa goldfields (<i>Lasthenia conjugens</i>)	FE/--/1B.1	Cismontane woodland, playas, valley and foothill grassland, and vernal pools. Blooms March – June. Elevation 0 – 470 meters.	Low. Marginal suitable habitat within Study Area. Nearest recent CNDDDB occurrence (occurrence #37) is 2 mi away from 1959.
Bristly leptosiphon (<i>Leptosiphon acicularis</i>)	--/4.2	Chaparral, cismontane woodland, coastal prairie, Valley and foothill grassland. Blooms April – July. Elevation 55 – 1500 meters.	Low. Study Area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
Beach layia (<i>Layia carnosa</i>)	FE/SE/1B.1	Coastal dunes, coastal scrub, on sparse vegetated, semi-stabilized dunes, usually behind foredunes. Elevation 3 – 30 meters.	Not Expected. No suitable habitat present within Study Area.
Rose leptosiphon (<i>Leptosiphon rosaceus</i>)	--/1B.1	Coastal bluff scrub, grassy slopes on serpentine; sometimes on roadsides. Elevation 90 – 200 meters.	Not Expected. No suitable habitat present within Study Area.
Crystal Springs lessingia (<i>Lessingia arachnoidea</i>)	--/1B.2	Coastal sage scrub, valley and foothill grassland, cismontane woodland. Blooms July – October. Elevation 90 – 200 meters.	Not Expected. No suitable habitat present within Study Area.
Coast lily (<i>Lilium maritimum</i>)	--/1B.1	Coastal prairie or scrub, peatland, gaps in closed-cone-pine forest. Blooms May – August. Elevation 5 – 475 meters.	Low. Study Area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
San Mateo tree lupine (<i>Lupinus arboreus</i> var. <i>eximius</i>)	--/3.2	Chaparral and coastal scrub. Blooms April – July. Elevation 90 – 550 meters.	Low. Study Area outside species' known range.
Arcuate bush-mallow (<i>Malacothamnus arcuatus</i>)	--/1B.2	Chaparral, cismontane woodland. Blooms April – Sept. Elevation 1 – 735 meters.	Not Expected. No suitable habitat present within Study Area.
Davidson's bush mallow (<i>Malacothamnus davidsonii</i>)	--/1B.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland. Blooms June – Jan. Elevation 185 -1140 meters.	Low. Study Area is well outside species' elevation range.
Oregon meconella (<i>Meconella oregana</i>)	--/1B.1	Coastal prairie and coastal scrub. Elevation 60 -640 meters.	Not Expected. No suitable habitat present within Study Area.
Mt. Diablo cottonweed (<i>Micropus amphibolus</i>)	--/3.2	Openings on slopes, ridges, shallow soils, sedimentary or volcanic rocks. Blooms March – May. Elevation 45 – 825 meters.	Low. Study area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
Woodland woollythreads (<i>Monolopia gracilens</i>)	--/1B.2	Chaparral, valley and foothill grassland, cismontane woodland, broadleafed upland forest, North Coast coniferous forest. Blooms (Feb.) March – July. Elevation 120 – 975 meters.	Not Expected. No suitable habitat present within Study Area.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Pincushion navarretia (<i>Navarretia myersii</i> subsp. <i>myersii</i>)	--/--/1B.1	Vernal pools, that are often acidic. Blooms April – May. Elevation 20 – 330 meters.	Not Expected. No suitable habitat present within Study Area.
Patterson's navarretia (<i>Navarretia paradoxiclara</i>)	--/--/1B.3	Meadows and seeps. Blooms May – June. Elevation 150 -430 meters.	Not expected. This species is endemic to ultramafic soils, which are not present in the Study Area.
White-rayed pentachaeta (<i>Pentachaeta bellidiflora</i>)	FE/SE/1B.1	Grassy or rocky areas. Blooms March – May. Elevation up to 620 meters.	Not Expected. Study Area not within elevation range and does not provide suitable habitat.
Michael's rein orchid (<i>Piperia michaelii</i>)	--/--/4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Blooms April – August. Elevation 3 – 915 meters.	Low. Study Area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
Choris' popcornflower (<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>)	--/--/1B.2	Chaparral, coastal scrub, coastal prairie. Blooms March – June. Elevation 5-705 meters.	Not Expected. Study Area does not provide suitable habitat.
San Francisco popcornflower (<i>Plagiobothrys diffusus</i>)	--/SE/1B.1	Valley and foothill grassland, coastal prairie. Blooms March – June. Elevation 45 – 360 meters.	Not Expected. Study Area does not provide suitable habitat.
Hairless popcornflower (<i>Plagiobothrys glaber</i>)	--/--/1A	Wet, saline to alkaline soils in valleys and coastal marshes. Blooms March – May. Elevation up to 100 meters.	Not Expected. Presumed extinct in California.
Oregon polemonium (<i>Polemonium carneum</i>)	--/--/2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Blooms April – Sept. Elevation 0 -1830 meters.	Low. Study area is within the species' range, but potential habitat for this species at the Study Area is limited in extent and of low quality.
Marin knotweed (<i>Polygonum marinense</i>)	--/--/3.1	Coastal salt and brackish marshes, swamps. Blooms April – August. Elevation up to 10 meters.	Low. Tidal salt marsh provides suitable habitat. Has not been observed in the East Bay since 1863 (CNDDDB occurrence #18). Unlikely to colonize a restored marsh without nearby populations.
Lobb's aquatic buttercup (<i>Ranunculus lobbii</i>)	--/--/4.2	Freshwater standing water. Blooms Feb. – May. Elevation 15 – 470 meters.	Low. Study Area does not provide suitable habitat. Study area is within the species' range, but not within documented elevation range.
Adobe sanicle (<i>Sanicula maritima</i>)	--/SR/1B.1	Moist clay or ultramafic soils. Blooms Feb. – May. Elevation 15 – 215 meters.	Low. Study Area provides marginal suitable habitat and the species is not known to occur within or near the Study Area.
Chaparral ragwort (<i>Senecio aphanactis</i>)	--/--/2B.2	Drying alkaline flats. Blooms Jan. – April (May). Elevation 20 -1020 meters.	Low. Study Area provides marginal suitable habitat and no known or recent occurrences within or near the Study Area.
Long-styled sand-spurrey (<i>Spergularia macrotheca</i> var. <i>longistyla</i>)	--/--/1B.2	Alkaline marshes and swamps, meadows and seeps. Bloom Feb. – May (June). Elevation 0-220 meters.	Low. Study Area provides marginal suitable habitat.
Most beautiful jewelflower (<i>Streptanthus albidus</i> subsp. <i>peramoenus</i>)	--/--/1B.2	Chaparral, valley and foothill grassland, cismontane woodland. Serpentine outcrops, ridges, and slopes. Blooms March – October. Elevation 90 – 1040 meters.	Not Expected. Study Area does not provide suitable habitat.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Slender-leaved pondweed (<i>Stuckenia filiformis</i> subsp. <i>alpine</i>)	--/--/2B.2	Marshes, swamps, shallow, clear water of lakes and drainage channels. Blooms May – July. Elevation 5 – 2325 meters.	Low. Study Area provides marginal suitable habitat.
California seablite (<i>Suaeda californica</i>)	SE/--/1B.1	Margins of coastal salt marshes. Blooms July – Oct. Elevation 0-5 meters.	Low. Study Area provides suitable habitat. Closest CNDDDB occurrence is located 0.5 miles north and was planted in 2007 (occurrence #20); Many occurrences are the result of planting efforts rather than natural recruitment.
Saline clover (<i>Trifolium hydrophilum</i>)	--/--/1B.2	Salt marshes, open areas in alkaline soils. Blooms April - June. Elevation up to 335 meters.	Low. Tidal and diked salt marshes provide suitable habitat. Closest CNDDDB occurrence is located 10.5 miles north and observed sited in 1895 (occurrence #28). Many historic records from the Bay Area, but no nearby recent occurrences. Unlikely to colonize a restored tidal marsh.
San Francisco owl's – clover (<i>Triphysaria floribunda</i>)	--/--/1B.2	On serpentine and non-serpentine substrate. Blooms April – June. Elevation 1 – 150 meters.	Not Expected. Study Area does not provide suitable habitat.
Oval-leaved viburnum (<i>Viburnum ellipticum</i>)	--/--/2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest. Blooms May – June. Elevation up to 300 meters.	Not Expected. Study Area does not provide suitable habitat.

Status Codes:

USFWS (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government

FT = Listed as Threatened by the Federal Government.

FC = Listed as Candidate

BCC = USFWS Bird of Conservation Concern

CDFW (California Department of Fish and Wildlife)

SE = Listed as Endangered by the State of California

ST = Listed as Threatened by the State of California

CT = Candidate Threatened by the State of California

CFP = California Fully Protected species

SSC = Species of Special Concern

WBWG = Western Bat Working Group

California Native Plant Society:

List 1A=Plants presumed extinct in California

List 1B=Plants rare, Threatened, or Endangered in California and elsewhere

List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere

List 3= Plants about which more information is needed

List 4= Plants of limited distribution

An extension reflecting the level of threat to each species is appended to each rarity category as follows:

.1 – Seriously endangered in California

.2 – Fairly endangered in California

.3 – Not very endangered in California

Potential to Occur Categories:

Absent/Not Expected = The Project and/or immediate vicinity does not support suitable habitat for a particular species. Study Area may be outside of the species' known range.

Low Potential = The Project and/or immediate vicinity only provides limited habitat. In addition, the species' known range may be outside of the Study Area.

Moderate Potential = The Project and/or immediate vicinity provides suitable habitat.

High Potential = The Project and/or immediate vicinity provides ideal habitat conditions or the species has been observed.

Present = Species has been recorded within the Study Area or immediate vicinity.

SOURCES: California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base, 2021. Available online at <http://dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>; California Native Plant Society, Inventory of Rare, Threatened and Endangered Plants of California, 2021. Available online at <http://www.rareplants.cnps.org/>; U.S. Fish and Wildlife Service (USFWS), iPac Information for Planning and Conservation. Online database powered by ECOS Environmental Conservation Online System, 2021. Available online at <https://ecos.fws.gov/ipac/>.

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Appendix C

Plants and Wildlife Observed in the Study Area

TABLE C-1
WILDLIFE SPECIES OBSERVED IN THE STUDY AREA DURING THE RECONNAISSANCE SURVEY IN APRIL 2021

Common Name	Scientific Name
Birds	
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Mallard	<i>Anas platyrhynchos</i>
Great blue heron	<i>Ardea herodias</i>
Canada goose	<i>Branta canadensis</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Anna's hummingbird	<i>Calypte anna</i>
Turkey vulture	<i>Cathartes aura</i>
Killdeer	<i>Charadrius vociferus</i>
Northern harrier	<i>Circus hudsonius</i>
Common raven	<i>Corvus corax</i>
American coot	<i>Fulica americana</i>
Barn swallow	<i>Hirundo rustica</i>
Western gull	<i>Larus occidentalis</i>
Alameda song sparrow	<i>Melospiza melodia pusillula</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Northern shoveler	<i>Spatula clypeata</i>
Willet	<i>Tringa semipalmata</i>
Yellowlegs	<i>Tringa sp.</i>
Mourning dove	<i>Zenaida macroura</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Mammals	
California ground squirrel	<i>Otospermophilus beecheyi</i>
Invertebrates	
California horn snail	<i>Cerithideopsis californica</i>

TABLE C-2
PLANT SPECIES OBSERVED IN THE STUDY AREA DURING THE RECONNAISSANCE SURVEY IN APRIL 2021

Family	Scientific Name	Common Name	
Aizoaceae	<i>Mesembryanthemum nodiflorum</i>	small flowered iceplant	
Apiaceae	<i>Conium maculatum</i>	poison hemlock	
	<i>Foeniculum vulgare</i>	Fennel	
Araliaceae	<i>Hedera helix</i>	English ivy	
Arecaceae	<i>Phoenix canariensis</i>	Canary island date palm	
Asteraceae	<i>Baccharis pilularis subsp. consanguinea</i>	coyote brush	
	<i>Carduus pycnocephalus</i>	Italian thistle	
	<i>Centaurea melitensis</i>	purple star thistle	
	<i>Cotula coronopifolia</i>	brass buttons	
	<i>Dittrichia graveolens</i>	stinkwort	
	<i>Grindelia stricta var. angustifolia</i>	marsh gumplant	
	<i>Helminthotheca echioides</i>	bristly ox-tongue	
	<i>Jaumea carnosa</i>	marsh jaumea	
	<i>Lactuca serriola</i>	prickly lettuce	
	<i>Matricaria discoidea</i>	Pineapple weed	
	<i>Senecio vulgaris</i>	common groundsel	
	Brassicaceae	<i>Brassica nigra</i>	black mustard
		<i>Hirschfeldia incana</i>	wild mustard
<i>Nasturtium officinale</i>		watercress	
<i>Rhaphanus sativus</i>		wild radish	
<i>Sinapis arvensis</i>		charlock mustard	
Chenopodiaceae	<i>Atriplex lentiformis</i>	big saltbush	
	<i>Atriplex prostrata</i>	fat hen	
	<i>Atriplex semibaccata</i>	Australian saltbush	
	<i>Beta vulgaris</i>	wild beet	
	<i>Salicornia pacifica</i>	pickleweed	
	<i>Salsola soda</i>	Russian thistle	
	<i>Convolvulus arvensis</i>	Field bindweed	
Cyperaceae	<i>Bolboschoenus maritimus</i>	alkali bulrush	
Fabaceae	<i>Acacia</i> sp.	acacia	
	<i>Lotus corniculatus</i>	bird's foot trefoil	
	<i>Medicago polymorpha</i>	bur clover	
	<i>Trifolium dubium</i>	shamrock clover	
	<i>Vicia</i> sp.	vetch	
Frankeniaceae	<i>Frankenia salina</i>	alkali heath	
Geraniaceae	<i>Erodium cicutarium</i>	red stemmed filaree	
Iridaceae	<i>Sisyrinchium bellum</i>	blue eyed grass	
Juncaceae	<i>Juncus balticus</i>	Baltic rush	
	<i>Juncus mexicanus</i>	Mexican rush	
Juncaginaceae	<i>Triglochin concinna</i>	arrow grass	
Myrtaceae	<i>Eucalyptus camaldulensis</i>	red river gum	
Oleaceae	<i>Olea europaea</i>	Olive	
Oxalidaceae	<i>Oxalis pes-caprae</i>	Bermuda buttercup	
Plantaginaceae	<i>Plantago coronopus</i>	cut leaf plantain	
	<i>Plantago lanceolata</i>	narrow leaved plantain	

Family	Scientific Name	Common Name
Plumbaginaceae	<i>Limonium californicum</i>	California sea lavender
	<i>Limonium ramosissimum</i>	Algerian sea lavender
Poaceae	<i>Avena barbata</i>	slender oat
	<i>Avena fatua</i>	wild oat
	<i>Bromus diandrus</i>	ripgut brome
	<i>Bromus hordeaceus</i>	soft brome
	<i>Cortaderia jubata</i>	pampass grass
	<i>Distichlis spicata</i>	salt grass
	<i>Elymus triticoides</i>	beardless wildrye
	<i>Festuca myuros</i>	rattail sixweeks grass
	<i>Festuca perennis</i>	Italian rye grass
	<i>Hordeum murinum</i>	foxtail barley
	<i>Phalaris aquatica</i>	harding grass
	<i>Phalaris paradoxa</i>	hood canarygrass
	<i>Polypogon monspeliensis</i>	rabbitsfoot grass
	<i>Spartina alterniflora x foliosa</i>	hybrid smooth cordgrass
	<i>Spartina foliosa</i>	California cordgrass
Rubiaceae	<i>Galium aparine</i>	sticky willy
Salixaceae	<i>Salix lasiolepis</i>	arroyo willow
Typhaceae	<i>Typha angustifolia</i>	narrow leaf cattail
	<i>Typha latifolia</i>	broadleaf cattail
Urticaceae	<i>Urtica urens</i>	annual stinging nettle
Verbenaceae	<i>Phyla nodiflora</i>	lippia

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