Appendix D
Habitat Assessment

ESA

TISCORNIA MARSH HABITAT RESTORATION AND SEA LEVEL RISE ADAPTATION PROJECT

Habitat Assessment

Prepared for
Marin Audubon Society

December 2020

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December 2020

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TABLE OF CONTENTS

Tiscornia Marsh Restoration and Sea Level Rise Adaptation Project – Habitat Assessment

List of Figures

List of Tables

Appendices

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SUMMARY

Environmental Science Associates (ESA) conducted biological reconnaissance surveys within the approximately 38-acre Tiscornia Restoration and Sea Level Rise Adaptation Project (Project) site, located in the City of San Rafael, California. The Project plans to create a nature based buffer against sea level rise, preserve and restore critical wildlife habitat, and provide access to the Bay Trail. 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.

The following upland habitat types occur in the Study Area: ruderal/nonnative grassland, turf, coastal scrub, landscaped, and developed. Aquatic habitat types in the Study Area include tidal salt marsh, diked marsh, tidal waters/mudflat, and pond.

The Study Area provides suitable habitat for special status plants, including Point Reyes bird's-beak, Marin knotweed, Suisun Marsh aster, and Congested-headed hayfield tarplant.

The Study Area provides suitable habitat for special-status fish and wildlife species including California Central Valley and Central California Coast steelhead DPSs, Sacramento River winter-run, Central Valley spring-run, and Central Valley fall/late fall-run Chinook Salmon ESUs, longfin smelt, Southern DPS of North American green sturgeon, California black rail, California Ridgway's (California clapper) rail, northern harrier, salt-marsh common yellowthroat, San Pablo song sparrow, and salt marsh harvest mouse.

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CHAPTER 1
Introduction

This report includes a description of habitat types, sensitive natural communities, and the potential presence and distribution of common and special-status plant and wildlife species at the proposed Tiscornia Marsh Restoration and Sea Level Rise Adaptation Project site and surrounding area (Study Area).

1.1 Background and Purpose for the Habitat Assessment

The intent of this document is to characterize the existing biological resources of the Study Area to support environmental permitting, CEQA analysis, 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, 2020), California Native Plant Society Electronic Inventory (CNPS, 2020), U.S. Fish and Wildlife species list (USFWS, 2020), reconnaissance-level field surveys, and other biological literature.

Habitat types and associated wildlife were identified using records, field observations, and aerial imagery. Environmental Science Associates (ESA) conducted two reconnaissance-level surveys of the Study Area on December 19, 2019 and May 13, 2020 to gather information and verify existing data on habitat types, sensitive natural communities, and potential habitat use of wildlife on and surrounding the site.

1.2 Project Description

The Tiscornia Restoration and Sea Level Rise Adaptation Project (Project), led by the Marin Audubon Society (MAS), proposes to address potential flooding and habitat degradation along San Rafael's Canal Area shoreline. The Project plans to create a nature based buffer against sea level rise, preserve and restore critical wildlife habitat, and provide access to the Bay Trail. MAS acquired Tiscornia Marsh, located at the mouth of the San Rafael Canal, in 2008. The 20-acre Tiscornia Marsh property, which was donated by Mary Tiscornia, consists of vegetated marsh, mudflats, shoreline levee, and a 500-foot reach of public trail that connects segments of the Bay Trail (Figure 1). There are currently two main concerns for the Tiscornia Marsh property. First, the tidal marshlands have experienced considerable erosion over the past 30 years, retreating as much as 200 feet, with approximately 3 acres lost. This erosion has resulted in significant loss of habitat for the endangered California Ridgway's rail and salt marsh harvest mouse, migratory shorebirds, and other important marsh wildlife. Second, the levee segment on the Tiscornia

property is relatively low, and therefore at risk of overtopping during an extreme coastal flood events. Both of these conditions are expected to worsen in the coming decades as sea level rises.

The Project's preliminary design concept was developed with three overarching goals:

1. Enhance ecological function of the Project site,
2. Increase flood protection, and
3. Foster healthy public engagement.

1.3 Description of Study Area

The Project site is located in the City of San Rafael at the mouth of the San Rafael Canal and along the San Pablo Bay shoreline. Tiscornia Marsh, the tidal marsh portion of the Project site, is bounded to the west by the Al Boro Community Center and Pickleweed Park, a soccer field, and diked salt marsh, all of which are enclosed by a combined perimeter levee and trail. The Study Area for this Habitat Assessment is shown in **Figure 1**.

Tiscornia Marsh is one of a very few small areas of tidal marsh remaining in Central San Rafael. Historically, tidal marshes extended deep into what today is downtown San Rafael, and historic mapping shows that the location of the current levee along the west side of Tiscornia Marsh was the historic wetland/bay shoreline. Tiscornia Marsh thus most likely formed from accretion on the historic mudflats. The marsh is comprised of a thin band of high marsh habitat, dominated by pickleweed (*Salicornia pacifica*), which transitions abruptly from a 3- to 4-foot escarpment to a wide mudflat extending bayward. This band of marshland is most narrow at its north end, expands to the south, along the adjacent levee and soccer field, and becomes very thin as it curves eastward along the shoreline levee bordering the south end of the marsh. A single tidal channel enters the marsh from the northern edge bordering the San Rafael Canal and extends southward through most of the length of the marsh.

There are two Pacific Gas and Electric (PG&E) power line towers located within the marsh, which can be accessed by two wooden service walkways. One walkway runs generally northeast to southwest to a tower within the northern portion of the marsh, and the second runs in west-east to a tower adjacent to the bayward edge of the marsh. This tower was formerly surrounded by pickleweed marsh, which has since eroded as described below.

1.3.1 Regional Setting

The Study Area is located in Marin County along San Pablo Bay. Marin County has a diverse topography and microclimate, and has an associated high diversity of vegetation and wildlife, 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% of its historic tidal wetlands. The Study Area is within the City of San Rafael which is a small valley confined by headlands with urban development along the San Rafael Canal.

SOURCE: aerial (ESRI)

Tiscornia Marsh Restoration and Sea level Rise Adaptation . 160888.01

Figure 1
Study Area

ESA

1.3.2 Ecological Site History and Ongoing Erosion

Prior to the development the San Rafael Regional Shoreline, Tiscornia Marsh formed the edge of open bay/mudflats immediately adjacent to a larger marsh complex that existed from a little east of today's shoreline deep into downtown San Rafael, with San Rafael Creek bisecting and supporting much of this tidal marsh. By 1943, the shoreline had been leveed and marsh had accreted on the mudflats bayward of what was the historic wetland shoreline. The general site location is illustrated in **Figure 2** on the 1853 U.S. Coast and Geodetic Survey T-Sheet for the area. Aside from the larger scale changes that were occurring throughout the Bay Area within the past century, sediment delivery to the site was also altered by development of the City of San Rafael, filling of the Bay, and construction of the Spinnaker neighborhood to the south. More recently, recurrent maintenance dredging of San Rafael Creek for navigation purposes has created a local sediment sink adjacent to the marsh.

Aerial images dating from 1987 indicate that the marsh has been eroding rapidly in the last several decades. The retreat of the bayward marsh edge has been most rapid at the northern edge of the site, eroding at a rate of 4-5 feet per year since 2004, when most aerial images were available. The rate of retreat decreases with distance moving south along the marsh edge, declining to as little as 1 foot per year where the marsh intersects the shoreline (ESA 2018).

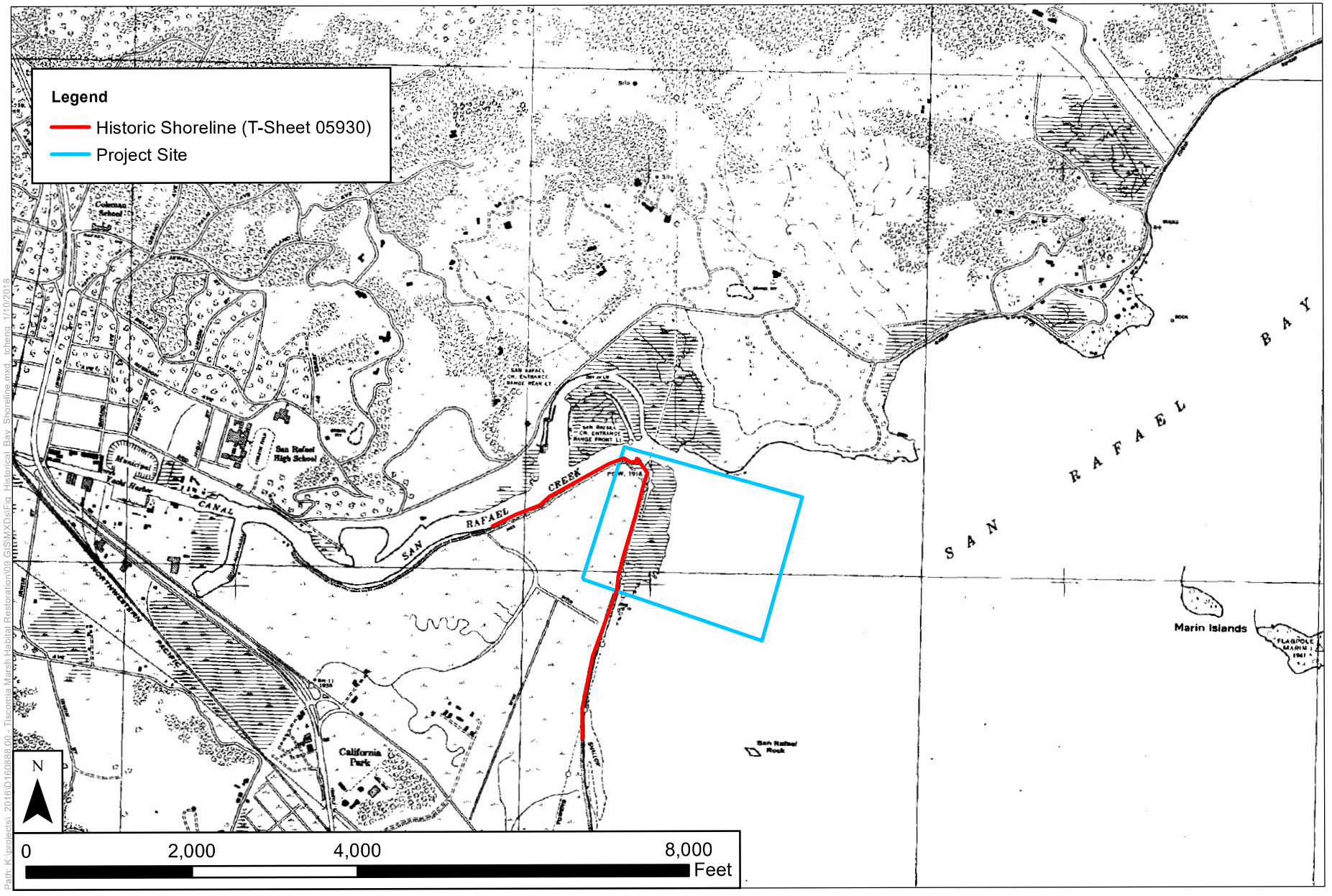
1.4 Regulatory Context

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

1.4.1.1 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 United States 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.



SOURCE: NOAA (T-Sheet)

D160888.00 Tiscornia Marsh Habitat Restoration and Sea Level Rise Adaptation

Figure 2
Historical Marsh Shoreline
NOAA T-Sheet 05930 (1943)

ESA

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.

1.4.1.2 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.

1.4.1.3 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.

1.4.1.4 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.

1.4.1.5 Waters of the U.S.

The 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.

[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.

Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. § 403) requires authorization from the Corps 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, 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 Corps to grant permission to alter, occupy, or use a Corps 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

1.4.2.1 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 which is described in the Regulatory Framework in Section 3.1.

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.

1.4.2.2 Rivers, Streams, and Lakes

Pursuant to Division 2, Chapter 6, Section 1600 et seq. of the 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).

1.4.2.3 Section 3503 California Fish and Game Code

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 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.

1.4.2.4 California Fully Protected Species

California law (Fish and Game Code Sections 3511 birds, 4700 mammals, 5050 reptiles and amphibians and 5515 fish) allows 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*), and California black rail (*Laterallus jamaicensis coturniculus*) are California fully protected species.

1.4.2.5 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.

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 CNDDB 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 Local Regulations

1.4.3.1 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. These areas are defined in the McAteer-Petris Act (PRC Section 66610) as:

- San Francisco Bay, being all areas that are subject to tidal action from the south end of the Bay to the Golden Gate (Point Bonita-Point Lobos) and to the Sacramento River line (a line between Stake Point and Simmons Point, extended northeasterly to the mouth of Marshall Cut), including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (land laying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide).
- A shoreline band consisting of all territory located between the shoreline of San Francisco Bay as defined above and a line 100 feet landward of and parallel with that line, but excluding any portions of such territory which are included in other areas of BCDC jurisdiction; provided that the Commission may, by resolution, exclude from its area of jurisdiction any area within the shoreline band that it finds and declares is of no regional importance to the Bay.

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 1). The Study area includes parcels owned by Marin Audubon Society, the City of San Rafael, the federal government, and the State of California.

Note that although this 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 in order to identify habitat values for many species including nesting raptors, passerine birds, and many terrestrial species that may be located in an adjacent area or may move between the Project site and an adjacent area.

2.2 Survey Dates and Surveying Personnel

Environmental Science Associates (ESA) wetland restoration ecologist Stephanie Bishop and wildlife biologist Leonard Liu conducted a reconnaissance-level plant and wildlife survey of the Study Area on December 19, 2019; and Stephanie Bishop and ESA biologist Michelle Giolli conducted a reconnaissance-level plant and wildlife survey on May 13, 2020. The surveys were conducted to observe and characterize vegetation communities in the Study Area, to assess habitat quality and potential for common and special-status wildlife species, and to verify conditions described in site specific studies. Data collected in the reconnaissance surveys were 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 did not constitute protocol-level surveys and were not intended to determine the actual presence or absence of such species.

2.3 Review of Background Information

Some site specific biological studies and surveys have been performed in 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, 2020
- The CDFW California Natural Diversity Database (CNDDB), CDFW, 2020
- The California Native Plant Society (CNPS) online database, CNPS, 2020
- California Ridgway's Rail Survey Reports (Olofson Environmental, Inc. 2011-2016, 2018a, 2018b, 2020)
- eBird Hotspot for Pickleweed Park, Marin County, eBird, 2020

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 3** 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

The description of habitat types presented herein is based on field observations, review of previous biological studies and the standard *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986). Plant communities generally correlate with wildlife habitat types; wildlife habitats were classified and evaluated using the *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). The following upland habitat types occur in the Study Area: ruderal/nonnative grassland, turf, coastal scrub, landscaped, and developed. Aquatic habitat types in the Study Area include tidal salt marsh, diked marsh, tidal waters/mudflat, and pond. Habitat types within the Study Area are presented in **Figure 3**. **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.

TABLE 1
HABITAT TYPES BY ACREAGES

Habitat Type	Acreage[1]
Upland Habitat Types	
Ruderal/Non-Native Grassland	1.43
Turf	4.72
Coastal Scrub	0.32
Landscaped	3.32
Developed	3.90
Aquatic Habitat Types	
Tidal Salt Marsh	7.59
Diked Marsh	3.95
Tidal Waters/Mudflat	12.75
Pond	0.07
	38.05

NOTES:
[1] GIS calculations may not reflect exact acreage of Study Area due to rounding.

SOURCE: aerial (ESRI)

Tiscornia Marsh Restoration and Sea level Rise Adaptation . 160888.01

Figure 3
Habitat Types

ESA

3.1.1 Upland Habitat Types

3.1.1.1 Ruderal/Non-native Grassland/Turf

The upland areas of the Study Area are dominated by ruderal vegetation and non-native grassland. Ruderal and non-native grassland habitats are most prevalent in areas subject to frequent vegetation and soil disturbances including disked or fallow fields, construction sites, levees or trails, and railroad or other public utility rights of way. This habitat occurs mostly along the trail within the Study Area (see Photos 1, 2, and 3 in Appendix A). It is characterized by a dense growth of non-native grasses and forbs. Non-native invasive grasses common within the Study Area include wild oat (*Avena* sp.), Italian ryegrass (*Festuca perennis*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), seaside barley (*Hordeum marinum*), and foxtail barley (*Hordeum murinum*). Non-native invasive forbs common within this habitat in the Study Area include fennel (*Foeniculum vulgare*), bristly oxtongue (*Helminthotheca echioides*), and wild radish (*Raphanus sativus*). Some native grasses and herbs occurred intermittently throughout the ruderal vegetation and non-native grassland including pineapple weed (*Matricaria discoidea*) and meadow barley (*Hordeum brachyantherum*). Several native and non-native trees occur within the ruderal/non-native grassland along the trails including coast live oak (*Quercus agrifolia*), Canary island date palm (*Phoenix canariensis*) and acacia (*Acacia* sp.). Turf occurs at the soccer field in the Study Area (see Photo 4 in Appendix A). This field appears regularly mowed and contains non-native grasses and forbs including annual blue grass (*Poa annua*) and clover (*Trifolium* sp.).

In areas adjacent to trails and parks that are utilized by humans, wildlife use is likely limited. Canada geese (*Branta canadensis*) were seen foraging in the turf during the reconnaissance survey. Some other common wildlife that may use non-native grassland and ruderal habitats include western fence lizard (*Sceloporus occidentalis*), black-tailed jackrabbit (*Lepus californicus*) and other small mammals, and western meadowlark (*Sturnella neglecta*). The non-native grassland and ruderal habitat in areas directly adjacent to tidal and non-tidal wetlands is important as refugia habitat for marsh wildlife during high tides, storms, and flood events. Scattered trees next to the trail likely provide minimal wildlife habitat, but may provide foraging and nesting habitat for a wide variety of birds.

3.1.1.2 Coastal Scrub

A small strip of uplands between the tidal marsh and trail is comprised of coastal scrub habitat, dominated by shrubs such as California sagebrush (*Artemisia californica*) and coyote brush (*Baccharis pilularis*) (see Photo 5 in Appendix A). This area was planted several years ago by STRAW (Students and Teachers Restoring a Watershed) and Point Blue Conservation Science. The area contains several non-native and invasive species including pride of madeira (*Echium candicans*), dwarf mallow (*Malva neglecta*), and Canarian sea lavender (*Limonium perezii*), as well as non-native grasses and herbs found in the non-native grassland/ruderal habitat. Some native grasses and herbs also occur throughout the scrub habitat including creeping wildrye (*Elymus triticoides*) and California mugwort (*Artemesia douglasiana*).

The coastal scrub habitat in the Study Area provides wildlife refugia habitat for marsh wildlife during high tide, storm, and flood events. Many birds may utilize this coastal scrub habitat for foraging including San Pablo song sparrow (*Melospiza melodia samuelis*), white-crowned sparrow (*Zonotrichia leucophrys*), and red-winged blackbird (*Agelaius phoeniceus*).

3.1.1.3 Landscaped

Several different landscaped areas exist within the Study Area surrounding the Al Boro Community Center, Pickleweed Park, and nearby trails (see Photo 4 in Appendix A). Several trees are found throughout these landscaped areas including non-native sweet gum (*Liquidambar styraciflua*) and native black oak (*Quercus kelloggii*). Mowed grassy areas and wood-chipped areas exist under the tree canopy. The mowed grassy areas include mostly non-native grasses and herbs also found in the soccer field turf.

Trees can generally provide nesting, roosting, and foraging habitat for many species of birds. However, because these trees are near a parking area of a City park and near Waterfront Road, they may only provide nesting opportunities to birds willing to nest near areas of frequent human disturbance, such as California scrub jay (*Aphelocoma californica*), Northern mockingbird (*Mimus polyglottos*), and house finch (*Haemorhous mexicanus*). Predators to birds and other wildlife may also inhabitat these areas include raccoon (*Procyon lotor*) and Virginia opossum (*Didelphis virginiana*).

3.1.1.4 Developed

Developed areas include the community center buildings, a parking lot, and paved and unpaved trails (see Photos 1, 4, and 5 in Appendix A). The unpaved trail around the Study Area bisects the tidal marsh from the diked marsh, soccer field, and other landscaped and developed areas. Trees and shrubs are found scattered throughout the developed areas surrounding the parking lot and buildings and include non–native species such as golden rain tree (*Koelreuteria paniculata*), Marina strawberry tree (*Arbutus* x 'Marina'), and Crimson bottlebrush (*Callistemon citrinus*).

These trees can provide habitat to birds and other wildlife, but the buildings and paved areas themselves support few biological resources. The unpaved trail is likely used by wildlife to move between other wetland and upland habitats. Developed areas provide limited wildlife habitat and usually support only generalist, and sometimes non-native wildlife species that are tolerant of human presence and activities, such as house sparrow (*Passer domesticus*) and Virginia opossum.

3.1.1.5 Transition Zone

The transition zone within the Study Area encompasses upland habitat types adjacent to the tidal marsh. In the Study Area, a very narrow band, typically 5 to 30 feet wide, of ruderal/non-native grassland or coastal scrub exists before it abuts against the pedestrian trail. If necessary, wildlife could cross the pedestrian trail to other upland and wetland habitat during periods of high water levels due to high tides and storm events. However, for the purposes of this report, the transition zone is considered the narrow band of upland habitat between the tidal marsh and the trail. The transition zone is important refugia habitat for marsh wildlife during high tides, storms, and flood events. However, because the transition zone is so narrow and close to developed areas, wildlife utilizing this transition zone may be exposed to excessive predation.

3.1.2 Aquatic Habitat Types

3.1.2.1 Tidal Salt Marsh

Tidal salt marsh, found along the edge of San Pablo Bay and San Rafael Creek in the Study Area, is typical of tidal salt marsh in San Pablo Bay and contains low and mid-high marsh zones (See Photos 2, 3, and 6 in Appendix A). Due to the small size of the tidal salt marsh and the mix of the mid and high marsh plants at this site, the latter two zones are lumped below into the mid-high marsh zone. Vegetation communities in tidal wetlands are defined by tidal hydroperiod, salinity, soils, drainage, and species competition.

Low Marsh Zone

The low marsh zone consists of the marsh directly adjacent to San Pablo Bay, San Rafael Canal, and adjacent to small channels within the interior of the marsh. Low marsh generally occurs between elevations 3.3 and 5.5 ft. NAVD, or approximately mean tide level (MTL) to mean high water (MHW) (ESA 2018). The dominant plant species within the low marsh zone is California cordgrass (*Spartina foliosa*).

Mid-High Marsh Zone

The mid-high marsh zone occurs in the band between the uplands and trail and the narrow strip of low marsh along the San Pablo Bay shoreline. Mid - high marsh habitat generally occurs between 5.5 and 7.3 ft. NAVD, or between MHW and the highest tide (ESA 2018).

Vegetation within this zone is dominated by pickleweed (*Salicornia pacifica*). Jaumea (*Jaumea carnosa*) is also present in the lower elevations of the mid-high marsh zone. Many other species are found at the upper elevations of the high marsh and at the edge between high marsh and uplands including native salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and gumplant (*Grindelia stricta*). Both the size in area and the amount of plant diversity is greater in the mid-high marsh than in the low marsh zone within the Study Area. Some other native species encountered intermittently within the mid-high marsh habitat include marsh rosemary (*Limonium californicum*) and fat hen (*Atriplex prostrata*).

Tidal salt marsh vegetation throughout the Study Area provides nesting and foraging opportunities and cover for marsh bird species, including mallard (*Anas platyrhynchos*), great

blue heron (*Ardea herodias*), great egret (*Ardea alba*), marsh wren (*Cistothorus palustris*), San Pablo song sparrow (*Melospiza melodia samuelis*), red-winged blackbird (*Agelaius phoeniceus*), salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), and small mammals such as raccoon (*Procyon lotor*), 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 marsh habitats includes salt marsh harvest mouse, California Ridgway's rail, and California black rail.

3.1.2.2 Diked Marsh

Diked marsh habitat in the Study Area is dominated by pickleweed and contains varying densities of this plant (see Photo 7 in Appendix A). With a slight increase in elevation, pickleweed intergrades into areas composed of an assortment of hydrophytic species including, natives salt grass, alkali heath, and non-natives fat hen, and rabbitsfoot grass (*Polypogon monspeliensis*). Most of the diked marsh in the Study Area occurs west of the tidal salt marsh, behind the levee/trail. However, two other smaller areas of diked marsh occur in the northwest area of the Study Area around a pond and in an area of lower elevation (Figure 3).

Similar to tidal salt marsh, diked marsh can provide nesting, foraging, and refugia habitat for wildlife associated with tidal marsh vegetation. The lower water levels and sparse vegetation can attract foraging and nesting shorebirds such as sandpiper (*Calidris* spp.), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), short-billed dowitcher (*Limnodromus griseus*), and killdeer (*Charadrius vociferous*). Northern harrier commonly hunts over open marshes. Diked marshes also provide habitat for small rodents that occur in the tidal marshes in the region including saltmarsh harvest mouse.

3.1.2.3 Tidal Waters

San Pablo Bay, San Rafael Creek, and small channels within the tidal marsh consist of open water, bordered by stands of cordgrass. The tidal waters within the Study Area occur within intertidal elevations and thus are mudflat at low tide (see Photos 3 and 6 in Appendix A). Subtidal habitat occurs in San Rafael Creek and in San Pablo Bay adjacent to the Study Area where elevations are below the tide range and the substrate is, as a result, continuously submerged. Intertidal mudflat occurs upslope of the subtidal areas and in a few smaller tidal channels within the Study Area and is generally devoid of vegetation.

Mudflat within San Pablo Bay provides foraging opportunities for shorebirds. Migratory shorebirds that may forage in the mudflats along San Pablo Bay and San Rafael Creek during low tide, as well as the channel banks, include dunlin (*Calidris alpina*), willet (*Tringa semipalmata*), black-necked stilt, American avocet, marbled godwit (*Limosa fedoa*), and several sandpiper species.

During high tide the shallow waters may provide habitat for dabbling ducks such as mallard, northern shoveler, and gadwall; and the deeper waters may provide foraging and resting habitat for grebes, cormorants, and diving ducks.

San Rafael Creek (also referred to as San Rafael Canal) and the nearshore waters of San Rafael Bay provide shallow subtidal and intertidal benthic estuarine habitat for a wide variety of fish, wildlife and invertebrate species. Riprap and other shoreline structures, such as piles, provide some solid substrates. A twelve-month aquatic habitat survey of the Canal and nearshore waters adjacent to Tiscornia Marsh was conducted for the Corps of Engineers by the U.S. Fish and Wildlife Service in 1989 (Weinrich 1990). Benthic samples at the mouth of the Canal yielded numerous polychaete worms, as well as clams and snails. Three species of crabs were found: Dungeness (*Metacarcinus magister*), red rock (*Cancer productus*), and yellow shore crabs (*Hemigrapsus oregonensis*). Twenty-two species of fish were captured in the Canal and in San Rafael Bay during the yearlong survey. The most common species (accounting for 91 percent of the total fish captured) were northern anchovy (*Engraulis mordax*), shiner perch *(Cymatogaster aggregata),* yellowfin goby *(Acanthogobius flavimanus)*, threadfin shad *(Dorosoma petenense)*, and butter sole *(Isopetta isolepis)*. Seventeen species captured are endemic to California waters. Five introduced species were captured: Mississippi silverside (*Menidia audens*), threadfin shad, striped bass (*Morone saxatilis*), yellowfin goby and chameleon goby (*Tridentiger trigonocephalos*). Other aquatic species found included jellyfish, comb jellies, and two species of bay shrimp (Weinrich 1990).

In 2017 Environmental Science Associates (ESA) conducted fish sampling in the (restored) Hamilton Wetlands Preserve, approximately 6 miles north of Tiscornia Marsh. This effort resulted in capture and identification of 1841 individual fish, representing 12 species including native species: northern anchovy, Pacific herring (*Clupea pallasii*), Pacific staghorn sculpin (*Leptocottus armatus*), three-spined stickleback (*Gasterosteus aculeatus*), topsmelt (*Atherinops affinis*), California halibut (*Paralichthys californicus*), and Chinook salmon (*Oncorhynchus tshawytscha*); as well as non-native species: chameleon goby, yellowfin goby, rainwater killifish (*Lucania parva*), Shokihaze goby (*Tridentiger barbatus*), and striped bass (HDR et al. 2017).

3.1.2.4 Pond

One small pond, that appears man-made, occurs in the northwest corner of the Study Area near the San Rafael Canal (see Photo 8 in Appendix A). The open water pond may provide foraging and resting habitat for waterfowl and migrating birds. The pond edges are steep and provide limited cover for 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 (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 diked marsh and tidal marsh habitat types, described in Section 3.1.2 above and shown on Figure 3, both contain sensitive natural communities. The diked marsh and mid-high tidal marsh zones are both sensitive natural communities because they are dominated by pickleweed which equates to the Pickleweed Mat Alliance in the California Sensitive Natural Community List (CDFW 2019, Sawyer et al. 2009). The low tidal marsh zone is dominated by California cordgrass which corresponds to the California Cordgrass Marsh Alliance. Both the Pickleweed Mat Alliance and California Cordgrass Marsh Alliance have a State Rarity Ranking of S3.

Eelgrass (*Zostera marina*) is a native marine vascular plant indigenous to the softbottom bays and estuaries and occurs within San Pablo Bay. It has been afforded special management considerations by CDFW, USFWS, NMFS, and BCDC and can be considered a sensitive natural community. This eelgrass species is found from middle Baja California and the Sea of Cortez to northern Alaska along the west coast of North America, and is common in healthy, shallow bays and estuaries. The depth to which this species can grow is a function of light penetration, but it generally occurs within shallow subtidal elevations (Merkel 2014). Small patches of eelgrass have been documented offshore more than 2,500 feet from the Study Area (Merkel 2014). Eelgrass has not been found within the Study Area during past eelgrass surveys and is also not expected to occur within the Study Area due to the tidal waters within the Study Area occurring at intertidal mudflat elevations and not shallow subtidal elevations.

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 marsh, diked marsh, tidal waters, and pond) are also shown in Figure 3.

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.

Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*) is a California Rare Plant Rank (CRPR) 1B.2 species. Point Reyes bird's-beak is found in the heavy clay soils of coastal salt marshes of northern San Francisco Bay and occurs at the upper end of tidal zones. It is associated with pickleweed, salt grass, fat hen, and jaumea and is rarely found in non-tidal conditions. Point Reyes bird's-beak is an annual herb in the broomrape family (Orobanchaceae) that blooms from May to October. It typically occurs in low growing marsh vegetation in coastal salt marshes at elevations ranging from 0 to 30 feet. Point Reyes bird's-beak is known to occur 1.8 miles to the South and 3.2 miles to the north from the Study Area within historic tidal marshes. Potentially suitable tidal marsh habitat exists in the Study Area, however the tidal marsh in the Study Area was recently formed (within the last 50 to 150 years) and therefore likely less biologically diverse than most historic tidal marshes in the area that were formed between 2,000 and 5,000 years ago and potentially less likely to contain rare plants such as Point Reyes bird's-beak then historic tidal marshes.

Marin knotweed (*Polygonum marinense*), a CRPR 3.1 species, is an annual forb in the knotweed family (Polygonaceae) that blooms from May to August. It typically occurs in salt and brackish marshes between 0 to 30 feet. This species has been documented along the Marin County shoreline 2.7 miles from the Study Area to the north and 1.9 miles to the south in historic tidal marshes. Potentially suitable tidal marsh habitat exists in the Study Area, however the tidal marsh in the Study Area was recently formed and therefore likely less biologically diverse than most historic tidal marshes and potentially less likely to contain rare plants such as Marin knotweed then historic tidal marshes.

Suisun Marsh aster (*Symphyotrichum lentum*), a CRPR 1B.2 species, is a perennial forb in the sunflower family (Asteraceae) that blooms from May to November. It typically occurs along sloughs and channels in dense marsh vegetation in freshwater and coastal brackish marsh habitat at elevations ranging from 0 to 10 feet. The plant is a tall (3 to 6 feet) perennial with fairly large violet heads having ray flowers 10 to 12 mm (half inch) long. Historic occurrences exist along the San Pablo Bay shoreline in Marin, although the most recent observation occurs 4.2 miles from the Study Area across San Pablo Bay. Potentially suitable tidal marsh habitat exists in the Study Area.

Congested-headed hayfield tarplant (*Hemizonia congesta* subsp. *congesta*), a CRPR 1B.2 species, is an annual forb in the sunflower family (Asteraceae) that can have a wide blooming period between April to November. It typically occurs in grassy sites and marsh edges at elevations below 330 feet. Three occurrences exist between 4 and 5 miles to the west and north of

the Study Area. Non-native grassland between the trail and diked and tidal marsh provide suitable habitat for this species within the Study Area.

3.4.2 Special-Status Fish and Wildlife

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

3.4.2.1 Fish

California Central Valley and Central California Coast steelhead DPSs. The California Central Valley (CCV) and 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 and CCV steelhead migrate through San Pablo Bay waters in transit between freshwater spawning areas and the Pacific Ocean, and may therefore occur seasonally in the waters of the Study Area.

Sacramento River winter-run, Central Valley spring-run, and Central Valley fall/late fall-run Chinook Salmon ESUs. The population of Chinook salmon in the San Francisco Bay-Delta is comprised of three distinct races: winter-run, spring-run, and fall/late fall-run. These races or evolutionary significant units (ESUs) are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending three to five years at sea before returning to freshwater to spawn. These fish pass through the San Francisco Bay-Delta waters to reach their upstream spawning grounds. In addition, juvenile salmon migrate through San Pablo Bay en route to the Pacific Ocean.

Sacramento River winter-run Chinook salmon, listed as both state and federally endangered, migrate through San Francisco Bay from December through July with a peak in March (Moyle 2002). Spawning is confined to the mainstem Sacramento River and occurs from mid-April through August (Moyle, 2002). Juveniles emerge between July and October, and are resident in their natal stream 5-10 months followed by an indeterminate residency period in estuarine habitats (Moyle, 2002).

The state- and federal-listed threatened Central Valley spring-run Chinook salmon migrate to the Sacramento River from March to September with a peak spawning period between late August and October (Moyle, 2002). Juvenile salmon emerge between November and March, and are resident in streams for a period of 3 to 15 months before migrating to downstream habitats (Moyle, 2002).

The Central Valley fall/late fall-run Chinook salmon is a California species of special concern. These salmon enter the Sacramento and San Joaquin Rivers from June through December and spawn from October through December, with a peak in November. The Central Valley fall/late

fall run ESU is generally more common in San Pablo Bay than the Central Valley spring-run and Sacramento River winter-run ESUs.

Adult and juvenile (smolts) winter-run, spring-run, and fall-run Chinook salmon are known to occur in San Pablo Bay and the waters adjacent to the Study Area during migrations to upstream freshwater spawning habitat.

Longfin smelt, 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 present in San Pablo Bay.

Southern DPS of North American green sturgeon is a federal-listed threatened species. This anadromous fish is the most widely distributed member of the sturgeon family and the most marine-oriented of the sturgeon species. Green sturgeons range in the nearshore waters from Mexico to the Bering Sea and are common occupants of bays and estuaries along the western coast of the United States (Moyle et al., 1995). Adult green sturgeons migrate into freshwater beginning in late February with spawning occurring in March through July, with peak activity in April and June. After spawning, juveniles remain in fresh and estuarine waters for 1-4 years and then begin to migrate out to the sea (Moyle et al., 1995). The upper Sacramento River has been identified as the only known spawning habitat for the green sturgeon southern DPS. Green Sturgeon is not expected to use the Study Area as spawning ground; however, they do travel through San Pablo Bay waters and may utilize the Study Area for feeding.

3.4.2.2 Birds

California Ridgway's rail. The California Ridgway's rail (formerly known as the California clapper rail and hereafter RIRA) is a federally endangered, state endangered, and California fully protected species. RIRA 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 RIRA occurs only within salt and brackish marshes. In south and central San Francisco Bay, RIRA 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.

RIRA 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). RIRA 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. RIRA rely on marsh plants such as Pacific cordgrass (*Spartina foliosa*), bulrush (*Bolboschoenus maritimus*), and pickleweed for breeding and feeding.

As part of the San Francisco Estuary Invasive Spartina Project, Olafson Environmental Inc (OEI) has conducted annual monitoring of RIRA at treatment sites since 2010. RIRA were detected in Tiscornia Marsh in 2010, 2011, 2012, 2016, 2017, and 2018. Monitoring recorded a highest minimum count of six (6) RIRA in 2016, eleven (11) in 2017, and five (5) in 2018 (OEI 2016, OEI 2018a, OEI 2018b). However, RIRA were not detected during surveys in 2019 (OEI 2020). In its report on the 2017 RIRA monitoring, OEI notes about the Tiscornia Marsh site:

"Surprisingly, this small marsh fragment had one of the highest density rail populations of all sites surveyed by OEI in 2017. The site is small, relatively isolated, and does not support exceptional rail habitat, however it has supported an intermittent population of Ridgway's rails. … It is likely a pair has been successfully breeding at the site since [2016]." (OEI 2018a)

California black rail. 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, red fox, raptors, possibly river otter, raccoons, and feral cats. California black rail has not been detected during rail surveys within Tiscornia marsh (OEI 2011-2020). Several occurrences are documented within five miles of the Study Area (CDFW 2020). The nearest species occurrence is documented on the north side of the mouth of San Rafael Creek, in 2012 (CDFW 2020).

Northern harrier. 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. Suitable foraging or nesting habitat for the Northern harrier may occur within or nearby the Study Area.

Saltmarsh common yellowthroat. 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. Nests are placed on or near the ground in dense emergent vegetation or shrubs. The subspecies is a

California species of special concern due to major decline of both habitat and populations in the past decade, but is not currently listed as endangered or threatened. The common yellowthroat is also protected under the Migratory Bird Treaty Act and is a California species of special concern. Suitable habitat for this species may occur within the Study Area.

San Pablo song sparrow is one of three morphologically distinct song sparrow subspecies that occur in the San Francisco Bay region. This particular subspecies is endemic to the marshes fringing San Pablo Bay and is a California species of special concern. San Pablo song sparrow are primarily associated with high marsh, particularly pickleweed, and their territories are densest in areas where tidal channels are lined with gumplant (Shuford et al. 2008). This species was observed foraging and singing within the diked marsh during the reconnaissance-level surveys.

3.4.2.3 Mammals

Salt marsh harvest mouse are small, native rodents that are endemic to the salt marshes and adjacent diked wetlands of San Francisco Bay. Salt marsh harvest mice are listed as federally and state endangered species. This species is considered a California fully protected species. Suitable habitat for salt marsh harvest mouse is present in the tidal and diked marshes in the Study Area. It is anticipated salt marsh harvest mouse will occupy suitable pickleweed and marsh habitats within the Study Area.

The salt marsh harvest mouse (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.

Trapping studies conducted in 1990 for the US Army Corps of Engineers resulted in capture of fourteen SMHM in Tiscornia Marsh and fifteen in the adjacent diked wetland in Pickleweed Park (Flannery and Bias 1990 as reported in USACE 1992). No other records of recent captures or trapping efforts in the area have been found, however based upon habitat suitability, resource agencies would likely assume presence of this species for the purposes of Project environmental compliance.

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 study area is not part of major or local wildlife corridor/travel routes according to the CDFW's Essential Habitat Connectivity natural landscape blocks. The Study Area has limited connectivity opportunity since the upland areas surrounding the Study Area are developed neighborhoods. The Study Area is located over a mile to the south of China Camp State Park, which is the closest natural landscape block to the Study Area (CDFW 2017).

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.

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). Open water habitat of San Pablo Bay is designated as critical habitat for winter-run Chinook salmon, spring-run Chinook salmon, central California coast steelhead, Central Valley steelhead, and green sturgeon.

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 Pablo and Suisun 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. Sacramento Chinook salmon is the only one of these species that may be seasonally present in the Study Area, although historically Coho salmon were once common in San Francisco Bay.

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CHAPTER 4
Regulatory Considerations

Based on the Project Description (Section 1.3), Regulatory Context (Section 1.4), and Environmental Setting (Chapter 3), the anticipated regulatory permits and consultations that will be needed for the Project related to biological resources are shown in **Table 2** below. This list of potential permitting requirements is preliminary and may change based upon pre-application coordination with the regulatory agencies through the San Francisco Bay Restoration Regulatory Integration Team (BRRIT) and/or on the project design development.

TABLE 2
ANTICIPATED REGULATORY REQUIREMENTS RELATED TO BIOLOGICAL RESOURCES

Agency	Governing Regulation	Key Permit Triggers	Potential Requirement*
Federal			
U.S. Army Corps of Engineers	Clean Water Act Section 404, Rivers and Harbors Act Section 10	Section 404: Activities that take place in Waters of the United States (WOTUS), including the placement of dredged or fill materials. Section 10: Structures and work beneath, in, or over navigable waters.	Nationwide or Individual Permit
U.S. Fish and Wildlife Service	Endangered Species Act, Fish & Wildlife Coordination Act (FWCA), Migratory Bird Treaty Act (MBTA)	Consultation is triggered when there is federal agency approval (CWA Section 404, RHA Section 10) or funding and project would result in potential adverse effects on federally-listed wildlife species and critical habitat. California Ridgway's rail and salt marsh harvest mouse habitat present at the site.	FESA Section 7 Consultation
National Marine Fisheries Service	Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act	Consultation is triggered when there is federal agency approval (CWA Section 404, RHA Section 10) or funding, and project would result in potential adverse effects on federally-listed fish or Critical Habitat or Essential Fish Habitats. California central valley and central California coast steelhead, Sacramento River winter-run and central valley spring-run Chinook salmon, longfin smelt, and green sturgeon habitat present at site. Site is within critical habitat for winter-run Chinook salmon, spring-run Chinook salmon, central California coast steelhead, Central Valley steelhead, and green sturgeon. Site is within coastal pelagic, pacific groundfish, and pacific salmon EFH.	FESA Section 7 and Magnuson-Stevens Fishery Conservation and Management Act Consultation
State			
Bay Conservation and Development Commission (BCDC)	McAteer-Petris Act	Filling, dredging, dredged sediment disposal, shoreline development, other work in the Bay or within 100 feet of the shoreline requires a BCDC permit.	Administrative or Major Permit
San Francisco Bay Regional Water Quality Control Board	Clean Water Act Section 401; Porter-Cologne Water Quality Act	CWA Section 401 certification required when a CWA Section 404 or RHA Section 10 permit required.	Water Quality Certification/Waste Discharge Requirements

* Potential permitting requirements are preliminary and may change during pre-application coordination with the regulatory agencies or as the project design develops.

CHAPTER 5
References and Report Preparation

5.1 References

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Appendix A
Representative Photographs

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Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 1

Developed trail with annual grassland/ruderal vegetation looking north from central part of the Study Area.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 2

Annual nonnative grassland just upland of tidal marsh with San Pablo Bay in the background. Photo taken from trail edge in the central part of the Study Area looking southeast.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 3

San Rafael Creek tidal waters, mudflat, and tidal marsh and adjacent non-native grassland in the northern section of the Study Area looking north.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 4

Developed trail on west side of the Study Area looking southeast at the soccer field (turf), landscaped trees (landscaped), and Al Boro Community Center buildings (developed).

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 5

Small strip of coastal scrub habitat in the Study Area adjacent to the trail.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 6

Tidal marsh and adjacent mudflat along San Pablo Bay in the Study Area.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 7

Diked marsh in the Study Area dominated by pickleweed.

Tiscornia Marsh Restoration and Sea Level Rise Adaptation . 160888.1

Photo 8

Small pond within the northwest corner of the Study Area

Appendix B

Special Status Fish, Wildlife, and Plant Species with Potential to Occur in the Tiscornia Marsh Restoration Project

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

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Invertebrates			
Western bumble bee (*Bombus occidentalis*)	-/CT	Found in any area with sufficient flowers for nutrition, and underground burrows for nest for the queen.	**Low.** Limited flowering plants present in the developed area surrounding the diked marsh.
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	FE/--	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	**Absent.** Project area outside species' known distribution.
Callippe silverspot butterfly (*Speyeria callippe callippe*)	FE/--	Host plant is *Viola pedunculata*. Most adults found on East-facing slopes; males congregate on hilltops in search of females.	**Absent.** Suitable habitat not found in Project area.
California freshwater shrimp (*Syncaris pacifica*)	FE/SE	Shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Absent.** Suitable habitat not found in Project area.
Amphibians			
California giant salamander (*Dicamptodon ensatus*)	--/SSC	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically adults use mammal burrows.	**Low**. Project area is isolated and surrounded by development; aquatic conditions are too saline for this species.
California red-legged frog (*Rana draytonii*)	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**. Project area is isolated and surrounded by development; aquatic conditions are too saline for this species.
Foothill yellow-legged frog (*Rana boylii*)	--/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 Project area.
Fish			
North American green sturgeon southern DPS (*Acipenser medirostris*)	FT/SSC	Spawns in Sacramento River. Known to rear and forage in the San Francisco Bay-Delta.	**Moderate.** Migrates within San Pablo Bay, so may occasionally stray into Study Area.
Tidewater goby (*Eucyclogobius newberryi*)	FE/SSC	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels	**Absent.** Presumed extirpated from San Francisco Bay.
Chinook salmon – fall/late fall-run ESU (*Oncorhynchus tshawytscha*)	--/SSC	Migrate through San Pablo Bay from spawning grounds in Central Valley rivers. Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.	**Moderate.** Migrates within San Pablo Bay, so may occasionally stray into Study Area.
Chinook salmon -Sacramento River winter-run ESU *(Oncorhynchus tshawytscha*)	FE/CE	Spawns and rears in Sacramento River and tributaries where gravelly substrate and shaded riparian habitat occurs.	**Low.** Migrates within San Pablo Bay, so may occasionally stray into Study Area.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Chinook salmon - Central Valley spring-run ESU (*Oncorhynchus tshawytscha*)	FT/CT	Spawns and rears in Sacramento River and tributaries where gravelly substrate and shaded riparian habitat occurs.	**Low.** Migrates within San Pablo Bay, so may occasionally stray into Study Area.
Steelhead – central California Coast DPS (*Oncorhynchus mykiss*)	FT/--	Requires cold, freshwater streams with suitable gravel for spawning. Rears in rivers and tributaries to the San Francisco Bay.	**Moderate.** Occasional steelhead from Corte Madera Creek run or other migrating steelhead may be present in the project area.
Longfin smelt (*Spirinchus thaleichthys*)	FC/ST	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 project area.
Sacramento splittail (*Pogonichthys macrolepidotus*)	--/SSC	Splittail are adjusted to a wide range of salinities and temperatures and depend on both brackish water for rearing habitat and floodplain/river-edge habitat for spawning.	**Low.** Once abundant throughout the San Francisco Estuary, splittail are now confined to Suisun Bay, Suisun Marsh, and the Napa, Petaluma, and Sacramento River systems.
Reptiles			
Western pond turtle (*Actinemys marmorata*)	--/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.** While adult turtles may use brackish or estuarine water as non-breeding aquatic habitat, the project area is surrounded by development and turtles have not been observed in the watershed.
Birds			
Short-eared owl (*Asio flammeus*)	--/SSC	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.** Suitable open habitat is limited in the Project area due to surrounding development.
Northern spotted owl (*Strix occidentalis caurina*)	FT/ST	In California, the northern spotted owl inhabits a mix of old and younger forests, featuring dense canopy closure of mature trees, abundant logs, standing snags, and live trees with broken tops.	**Absent.** Northern spotted owl activity centers present on the slope of Mt. Tamalpais but suitable forest habitat is not present in the Project area.
Burrowing owl (*Athene cunicularia*)	--/SSC	Nests and forages in low-growing grasslands with burrowing mammals.	**Low**. Project area grasslands are too disturbed to provide suitable habitat. Species occurrences are documented 2.5 miles north of the Project area in Gallinas.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Low.** Suitable sandy, gravelly soil habitat not found in the project area.
Northern harrier (*Circus cyaneus*)	--/SSC	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Moderate.** May forage over Tiscornia marsh. Likely breeds in marshes along San Pablo Bay.
Yellow rail (*Coturnicops noveboracensis*)	-/SSC	Winters in small numbers in brackish and tidal marshes of San Francisco Bay.	**Low.** Species is extremely rare but may winter in coastal marshes of San Pablo Bay.
White-tailed kite (*Elanus leucurus*)	--/CFP	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	**Present.** Observed foraging over project area marsh.
American peregrine falcon (*Falco peregrinus anatum*)	BCC/CFP	Nest consists of a scrape or a depression on rock, cliff or building ledge over an open site.	**Low.** Suitable foraging habitat in the Project area, but nesting habitat is not present.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Salt-marsh common yellowthroat (*Geothylpis thrichas sinuosa*)	--/SSC	In brackish and saline tidal marsh habitat around San Francisco Bay, associated with a high percent cover of rushes (*Scirpus* spp.), Peppergrass (*Leipidium latifolium*), and *Juncus*	**Moderate.** Tidal marsh in project area provides marginal habitat for this species though it is not dense enough for preferred habitat.
California black rail (*Laterallus jamaicensis*)	BCC/ST/ CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	**Moderate.** Tidal marsh in project area provides marginal habitat for this species, but it has not been detected during rail surveys. One species occurrence is documented nearby (less than 0.5 mile north of the Project area) in 2012. Multiple other occurrences are documented within 5 miles of the Project area.
Bank swallow (*Riparia riparia*)	--/ST	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Low.** Suitable habitat not found in the Project area.
Salt-marsh common yellowthroat (*Geothlypis trichas sinuosa*)	BCC/SSC	Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**Moderate.** Tidal marsh in project area provides marginal habitat for this species though it is not tall or dense enough for preferred habitat.
Alameda song sparrow (*Melospiza melodia pusillula*)	BCC/SSC	Salt marshes. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia*.	**Absent.** Project area outside subspecies' range.
San Pablo song sparrow (*Melospiza melodia samuelis*)	BCC/SSC	Inhabits tidal sloughs in *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	**Present.** Observed foraging and singing within the diked marsh.
Ridgway's rail [California clapper rail] (*Rallus obsoletus*)	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.** Known to breed in Pickleweed Park though 2019 surveys were negative. .
California least tern (*Sternula antillarum browni*)	FE/SE	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 project area.
Mammals			
Pallid bat (*Antrozous pallidus*)	--/SSC	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.** Although suitable habitat is present in Project area, high levels of disturbance may preclude presence.
Hoary bat (*Lasiurus cinereus*)	--/--/ WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Low**. Suitable dense foliage for roosting is not present within the Project area, but species may forage there.
Western red bat (*Lasiurus blossevillii*)	WBWG High	Roosts primarily in trees, 2-40 ft aboveground, from sea level up through mixed conifer forests. Prefers habitat edges & mosaics with trees that are protected from above & open below with open areas for foraging.	**Low**. Suitable roost trees are not present within the Project area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**Low.** Suitable shrub and open habitat is not present within the Project area.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
San Pablo vole (*Microtus californicus sanpabloensis*)	--/SSC	Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow	**Absent.** Project area outside of species' known range.
Big free-tailed bat (*Nyctinomops macrotis*)	--/SSC	Roost mainly in crevices and rocks in cliffs, but occasionally roosts in buildings, caves, and tree cavities in rugged, rocky habitats in arid landscapes.	**Low.** Suitable arid rocky habitat is not present within the Project area.
Salt-marsh harvest mouse (*Reithrodontomys raviventris*)	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 pickleweed marsh habitat within the Project area.
Salt-marsh wandering shrew (*Sorex vagrans halicoetes*)	--/SSC	Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among *Salicornia*.	**Moderate.** Diked pickleweed marsh habitat within the Project area provides low quality habitat.
American badger (*Taxidea taxus*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**Low.** No suitable open, dry habitat in the Project area.
Point Reyes jumping mouse (*Zapus trinotatus orarius*)	--/SSC	Primarily in bunch grass marshes on the uplands of Point Reyes. Also present in coastal scrub, grassland, and meadows.	**Absent.** Project area outside of species' known range.
Plants			
Napa false indigo (*Amorpha californica* var. *napensis*)	--/--/1B.2	Broadleafed upland forest, chaparral, or cismontane woodland. Blooms April - July. Elevation up to 2000 meters.	**Low.** No nearby recent occurrences. Landscaped trees within the Project area only provide marginal suitable habitat.
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub. Blooms March – June. Elevation up to 500 meters.	**Not expected.** Project area is outside species' known distribution.
Franciscan manzanita (*Arctostaphylos franciscana*)	FE/-- /1B.1	Serpentine chaparral. Blooms February - April. Elevation up to 300 meters.	**Not expected.** Project area is outside species' known distribution. No suitable habitat present in the Project area. Only one plant in the wild; others are from cultivation.
Mt. Tamalpais manzanita (*Arctostaphylos montana* subsp. *montana*)	--/--/1B.3	Serpentine chaparral. Blooms February - April. Elevation ranges from 250 – 800 meters.	**Not expected.** No suitable habitat present in the Project area. Project area not within elevation range.
Presidio manzanita (*Arctostaphylos montana* subsp. *ravenii*)	FE/SE/1B .1	Serpentine chaparral. Blooms February - April. Elevation ranges from 60 – 95 meters.	**Not expected.** No suitable habitat present in the Project area. Project area not within elevation range.
Marin manzanita (*Arctostaphylos virgata*)	--/--/1B.2	Sandstone, granite outcrops in chaparral, and conifer forests. Blooms December - March. Elevation up to 500 meters.	**Not expected.** Local occurrences documented in western portion of Ross Valley, but suitable habitat is lacking in the Project area.
Coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*)	--/--/1B.2	Coastal marshes, seeps, and adjacent sand. Blooms June – September. Elevation up to 150 meters.	**Low.** Project area outside species' known distribution.
Alkali-milk vetch (*Astragalus tener* var. *tener*)	--/--/1B.2	Alkaline flats, vernally moist meadows. Blooms March – June. Elevation up to 60 meters.	**Not expected.** Project area outside species' known distribution.
Thurber's reed grass (*Calamagrostis crassiglumis*)	--/--/2B.1	Mesic coastal scrub, freshwater marshes and swamps. Blooms May - August. Elevation ranges from 10 – 60 meters.	**Low.** No nearby recent occurrences. Project area not within elevation range.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Tiburon mariposa –lily (*Calochortus tiburonensis*)	--/--/1B.1	Open, rocky, slopes in serpentine grassland. Blooms March – June. Elevation up to 150 meters.	**Not Expected.** Endemic to Ring Mtn. Preserve on the Tiburon Peninsula. No suitable habitat within the Project area.
Bristly sedge (*Carex comosa*)	--/--/2B.1	Wet places. Blooms June – September. Elevation ranges from -5-1620 meters.	**Low.** No nearby recent occurrences.
Northern meadow sedge (*Carex praticola*)	--/--/2B.2	Moist to wet meadows, riparian edges, and open forest. Blooms May – July. Elevation up to 3200 meters.	**Low.** Only nearby occurrence is from 1967 on Angel island.
Tiburon paintbrush (*Castilleja affinis* var. *neglecta*)	FE/ST/1B.2	Open serpentine grassland slopes. Blooms April – June. Elevation ranges from 60 – 400 meters.	**Not Expected.** No suitable habitat present in the Project area. Project area not within elevation range.
Johnny-nip (*Castilleja ambigua* ssp. *ambigua*)	--/--/4.2	Coastal bluffs and grasslands. Blooms May – August. Elevation ranges from 0 – 435 meters.	**Low.** Marginal suitable habitat present. Recently documented 6 miles from the Project area.
Nicasio ceanothus (*Ceanothus decornutus*)	--/--/1B.2	Open, rocky serpentine slopes and ridges Blooms March – May. Elevation ranges from 235 - 290 meters.	**Not expected.** No suitable habitat present in the Project area. Project area not within elevation range.
Point Reyes bird's-beak (*Chloropyron maritimum* subsp. *palustre*)	--/--/1B.2	Coastal salt marsh. Blooms May – October. Elevation up to 10 meters.	**Moderate.** Tidal and diked salt marsh provide suitable habitat. Recent occurrence (CNDDB Occurrence #60) is 1.8 miles away from Project area.
Soft salty bird's-beak (*Chloropyron molle* subsp. *molle*)	FE/SR/--	Coastal salt marsh. Blooms July – November. Elevation up to 10 meters.	**Low.** Believed to be extirpated from Marin County. However, the surrounding counties do have recent occurrences and the tidal and diked salt marshes within the Project area provide suitable habitat.
San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)	--/--/1B.2	Sand. Blooms April – July. Elevation up to 300 meters.	**Low.** Small sandy areas present within the Project area provide marginal suitable habitat. No nearby recent occurrences.
Robust spineflower (*Chorizanthe robusta* var. *robusta*)	FE/--/1B.1	Sand or gravel. Blooms May – September. Elevation ranges from 10 to 300 meters.	**Low.** Small sandy and gravely areas present within the Project area provide marginal suitable habitat. No nearby recent occurrences.
Franciscan thistle (*Cirsium andrewsii*)	--/--/1B.2	Bluffs, ravines, seeps, and occasionally on serpentine. Blooms May – September. Elevation up to 100 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*)	--/--/1B.2	Serpentine seeps. Blooms June – September. Elevation ranges from 300 – 450 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Presidio clarkia (*Clarkia franciscana*)	FE/SE/1B.1	Serpentine. Blooms May – June. Elevation ranges from 25 – 335 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Round-headed Chinese houses (*Collinsia corymbosa*)	--/--/1B.2	Coastal sand dunes. Blooms April – June. Elevation up to 20 meters.	**Not expected.** No suitable habitat present within Project area.
San Francisco collinsia (*Collinsia multicolor*)	--/--/1B.2	Moist, shady scrub and forest. Blooms March – May. Elevation up to 300 meters.	**Not expected.** Project area outside species' known distribution.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Western leatherwood (*Dirca occidentalis*)	--/--/1B.2	North or north eastern facing slopes, mixed-evergreen forest to chaparral, generally in fog belt. Blooms November to March. Elevation ranges from 50 – 400 meters.	**Not expected.** Project area not within elevation range. Wooded areas in Project area only provide marginal suitable habitat. No nearby recent occurrences.
Tiburon buckwheat *(Eriogonum luteolum* var. *caninum*)	--/--/1B.2	Serpentine. Blooms May - September. Elevation up to 700 meters.	**Not expected.** No suitable habitat present within Project area.
San Francisco wallflower (*Erysimum franciscanum* var. *crassifolium*)	--/--/4.2	Often serpentinite or granitic, sometimes roadsides. Blooms March to June. Elevation ranges 0-550 meters.	**Not expected.** Most documented occurrences in Marin occur on cliffs or rocky slopes. Along trail in Project area may provide marginal suitable habitat, but preferred substrate not present and no nearby recent occurrences.
Minute pocket moss (*Fissidens pauperculus*)	--/--/1B.2	Damp coastal soil within conifer forests. Elevation ranges from 10 -1024 meters.	**Low.** No suitable habitat present within Project area. Project area not within elevation range.
Fragrant fritillary (*Fritillaria liliacea*)	--/--/1B.2	Heavy soils on open hills and fields near the coast. Blooms from February - April. Elevation up to 400 meters.	**Low.** Non-native grassland only provides marginal suitable habitat. No nearby recent occurrences.
Marin checker lily (*Fritillaria lanceolata* var. *tristulis*)	--/--/1B.1	Coastal scrub, prairie and woodland. Blooms February – May. Elevation ranges from 15-150 meters.	**Low.** Project area not within elevation range. Wooded areas and non-native grassland within Project area only provide marginal suitable habitat.
Blue coast gilia (*Gilia capitata* subsp. *chamissonis*)	--/--/1B.1	Coastal sand hills. Blooms April – June. Elevation up to 185 meters.	**Low.** Small sandy areas present within the Project area provide marginal suitable habitat. No nearby recent occurrences.
Dark-eyed gilia (*Gilia millefoliata*)	--/--/1B.2	Stabilized coastal dunes. Blooms March – July. Elevation up to 10 meters.	**Not expected.** No suitable habitat present within Project area.
San Francisco gumplant (*Grindelia hirsutula* var. *maritima*)	--/--/3.2	Sandy or serpentine slopes and seas bluffs. Blooms June – September. Not recognized by the Jepson Manual. Elevation ranges from 15 – 400 meters.	**Low.** Small sandy areas present within the Project area provide marginal suitable habitat. Project area not within elevation range.
Diablo helianthella (*Helianthella castanea*)	--/--/1B.2	Open, grassy areas. Blooms April – June. Elevation ranges from 60 – 1,300 meters.	**Low.** Project area not within elevation range. Non-native grassland within Project area provides marginal suitable habitat.
Congested-headed hayfield tarplant (*Hemizonia congesta* subsp. *congesta*)	--/--/1B.2	Grassy sites and marsh edges. Blooms April – November. Elevation up to 100 meters.	**Moderate.** Non-native grassland along diked and tidal marsh provide suitable habitat. Recent occurrences (CNDDB occurrence #'s 3, 6 and 49) are within 5 miles or Project area.
Marin western flax (*Hesperolinon congestum*)	FT/ST/1B.1	Serpentine grassland. Blooms April – August. Elevation up to 200 meters.	**Not expected.** No suitable habitat present within Project area.
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/SE/1B.1	Clay soils in grassy areas. Blooms June – November. Elevation up to 200 meters.	**Low.** Non-native grassland in Project area provides suitable habitat, but soils have not yet been studied. Two occurrences (CNDDB occurrence #s 24 and 25) approximately 5 miles away from the Project area; however, one is presumed to be extirpated, and the other has not been visited since 2002.
Kellogg's horkelia (*Horkelia cuneata* var. *sericea*)	--/--/1B.1	Old dunes and coastal sand hills. Blooms April – August. Elevation up to 200 meters.	**Low.** Sandy areas in Project area provide marginal suitable habitat. No nearby recent occurrences.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Thin-lobed horkelia (*Horkelia tenuiloba*)	--/--/1B.2	Sandy soils within open chaparral. Blooms April – July. Elvation ranges from 50 – 500 meters.	**Low.** Project area not within elevation range. Sandy areas in Project area provide marginal suitable habitat. Nearest recent occurrence (CNDDB occurrence # 4) is approximately 5 miles awat
Small groundcone (*Kopsiopsis hookeri*)	--/--/2B.3	Open woodland, mixed conifer fores, generally on *Gaultheria shallon*, and occationally on either *Arbutus menziesii* or *Arctostaphylos uva-ursi*. Blooms April – August. Elevation ranges from 120 – 1,435 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	--/--/1B.2	Coastal estuarine marshes. Blooms April – August. Elevation up to 30 meters.	**Low.** Tidal marsh provides suitable habitat. However, no occurrences within Marin county.
Beach layia (*Layia carnosa*)	FE/SE/1B .1	Coastal dunes. Blooms April – July. Elevation up to 70 meters.	**Not expected.** No suitable habitat present within Project area.
Rose leptosiphon (*Leptosiphon rosaceus*)	--/--/1B.1	Open, grassy slopes and coast bluffs. Blooms April – June. Elevation up to 100 meters.	**Low.** No nearby recent occurrences. Non-native grassland in Project area provides marginal suitable habitat
San Francisco lessingia (*Lessingia germanorum*)	FE/SE/1B .1	Sandy soils, coastal scrub and remnant dunes. Blooms June – November. Elevation from 25 – 110 meters.	**Not expected.** No nearby recent occurrences. Sandy areas in Project area provides marginal suitable habitat, but Project area not within elevation range.
Woolly headed lessingia (*Lessingia hololeuca*)	--/--/3	Clay, sepentinite soils, coastal scrub, grassland, roadsides. Blooms June – October. Elevation from 15-305 meters.	**Low.** Two recent occurrences within 3 miles of the Project area. Project area provides marginal suitable habitat, but Project area not within elevation range.
Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*)	--/--/1B.2	Thin, gravelly soils of serpentine outcrops and roadcuts. Blooms July – October. Elevation from 60 – 305 meters.	**Low.** No suitable habitat present within Project area.
Mason's lilaeopsis (*Lilaeopsis masonii*)	--/SR/1B.1	Intertidal marshes and streambanks. Blooms June – August. Elevation up to 36 meters.	**Low.** Tidal salt marsh provides suitable habitat, but no nearby recent occurrences. Project area is outside of presumed extent.
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Moist grassland and open woodland. Blooms April – June. Elevation up to 300 meters.	**Low.** Non-native grassland provides marginal suitable habitat.
Marin County navarretia (*Navarretia rosulata*)	--/--/1B.2	Rocky serpentine areas. Blooms May – July. Elevation from 200 – 600 meters. May – July. 200-635m	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
White-rayed pentachaeta (*Pentachaeta bellidiflora*)	FE/SE/1B .1	Grassy or rocky areas. Blooms March – May. Elevation up to 620 meters.	**Low.** Non-native grassland provides marginal suitable habitat. Several extirpated populations nearby. One occurrence (CNDDB occurrence # 14) approximately 3 miles away that was revisited in 2007.
Choris' popcorn-flower (*Plagiobothrys chorisianus* var. *chorisianus*)	--/--/1B.2	Grassy, moist places within ephemeral drainages, coastal scrub or chaparral. Blooms March – June. Elevation up to 650 meters.	**Low.** No nearby recent occurrences. Non-native grassland along margins of marsh provides marginal suitable habitat.
Hairless popcornflower (*Plagiobothrys glaber*)	--/--/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.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
North Coast semaphore grass (*Pleuropogon hooverianus*)	--/ST/1B.1	Wet grassy areas. Blooms March – June. Elevation up to 1,300 meters.	**Low.** No nearby recent occurrences. Non-native grassland along margins of marsh provides marginal suitable habitat.
Oregon polemonium (*Polemonium carneum*)	--/--/2B.2	Moist to dry, open areas. Blooms April – June. Elevation up to 1,800 meters.	**Low.** No nearby recent occurrences. Non-native grassland along margins of marsh provides marginal suitable habitat.
Marin knotweed (*Polygonum marinense*)	--/--/3.1	Coastal salt and brackish marshes, swamps. Blooms April – August. Elevation up to 10 meters.	**Moderate.** Tidal salt marsh provides suitable habitat. Three nearby recent occurrences (CNDDB occurrence #s 4, 6 and 20) within 3 miles of Project area.
Tamalpais oak (*Quercus parvula* var. *tamalpaisensis*)	--/--/1B.3	Understory of conifer woodlands. Blooms March – April. Elevation from 100 – 750 meters.	**Not expected.** Project area not within elevation range. No suitable habitat within Project area.
Lobb's aquatic buttercup (Runuculus lobbii)	--/--/4.2	Mesic, ponds, grasslands, vernal pools, woodlands. Blooms February – May. Elevation from 15 – 470 meters.	**Not expected.** No suitable habitat within Project area, mesic areas in Project areas are saline or brackish. Project area not within elevation range.
Abode sanicle (*Sanicula maritima*)	--/--/1B.1	Coastal, grassy, open wet meadows, ravines. Blooms February – May. Elevation from 30 -240 meters.	**Not expected.** Project area not within species' distribution.
Point Reyes checkerbloom (*Sidalcea calycosa* subsp. *rhizomata*)	--/--/1B.2	Freshwater marshes. Blooms May – July. Elevation up to 30 meters.	**Not expected.** No suitable habitat within Project area.
Marin checkerbloom (*Sidalcea hickmanii* subsp. *viridis*)	--/--/1B.1	Dry ridges near coast in serpentine areas. Blooms May – June. Elevation ranges from 50 – 430 meters.	**Not expected.** No suitable habitat within Project area.
Scouler's catchfly (*Silene scouleri* subsp. *scouleri*)	--/--/2B.2	Rocky slopes and coastal bluffs. Blooms March – September. Elevation up to 600 meters.	**Not expected.** No suitable habitat within Project area.
San Francisco campion (*Silene verecunda* subsp. *verecunda*)	--/--/1B.2	Sandy habitats in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and grassland. Blooms February – August. Elevation ranges from 30 – 645 meters	**Not expected.** Project area outside of species' distribution.
Santa Cruz microseris (*Stebbinsoseris decipiens*)	--/--/1B.2	Open, sandy, shale, or serpentine areas. Blooms April – May. Elevation ranges from 10 – 500 meters.	**Low.** No nearby recent occurrences. Possible marginal suitable sandy areas within non-native grassland.
Mt. Tamalpais jewelflower (*Streptanthus batrachopus*)	--/--/1B.3	Serpentine barrens and chaparral. Blooms April – July. Elevation ranges from 335 – 670 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Tiburon jewelflower (*Streptanthus glandulosus* ssp. *niger*)	FE/SE/1B.1	Shallow, rocky serpentine slopes in grassland. Blooms May – June. Elevation ranges from 30 – 150 meters.	**Not expected.** No suitable habitat present within Project area. Project area not within elevation range.
Mt. Tamalpais bristly jewelflower (*Streptanthus glandulosus ssp. pulchellus*)	--/--/1B.2	Dry, open grassland, chaparral, open conifer/oak woodland; occasionally on serpentine. Blooms May – August. Elevation ranges from 125 – 670 meters.	**Not expected.** Project area not within elevation range.
Suisun marsh aster (*Symphyotrichum lentum*)	--/--/1B.1	Marshes. Blooms May – November. Elevation ranges up to 300 meters.	**Moderate.** Tidal salt marsh within Project area provides suitable habitat. Recent occurrence (CNDDB occurrence # 147) is approximately 4 miles away from Project area.

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Two-fork clover (*Trifolium amoenum*)	FE/--/1B.1	Moist, heavy soils in disturbed areas, coastal bluff scrub, and grassland. Blooms April – June. Elevation ranges from 5 – 415 meters.	**Low.** Non-native grassland in Project area provides marginal suitable habitat. Most nearby occurrences have been extirpated.
Saline clover (*Trifolium hydrophilum*)	--/--/1B.2	Salt marshes, open areas in alkaline soils. Blooms April-June. Elevation up to 335 meters.	**Low.** No known occurrences in Marin county. Tidal and diked salt marshes provide suitable habitat.
San Francisco owl's-clover (*Triphysaria floribunda*)	--/--/1B.2	Coastal grassland and serpentine slopes. April-June. 10-160 m.	**Low.** No nearby recent occurrences. Non-native grassland provides marginal suitable habitat.
Coastal triquetrella (*Triquetrella californica*)	--/--/1B.2	Moss. Within 10 miles of the coast. Shaded soil, rocks, sand, or gravel in dry or moist areas. Reported from trails, roadsides, picknick areas, playgrounds, and rock outcrops. Elevation up to 100 meters.	**Low.** Some of the shaded developed recreation areas provide marginal suitable habitat. Recent occurrence (CNDDB occurrence #9) is approximately 3.5 miles away from Project area.

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
- BBC = 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
- CaT = 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. Project 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 Project 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 Project Area or immediate vicinity.

SOURCES: California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base, 2020. Available online at http://dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp; California Native Plant Society, Inventory or Rare, Threatened and Endangered Plants of California, 2020. 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, 2020. Available online at https://ecos.fws.gov/ipac/.

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