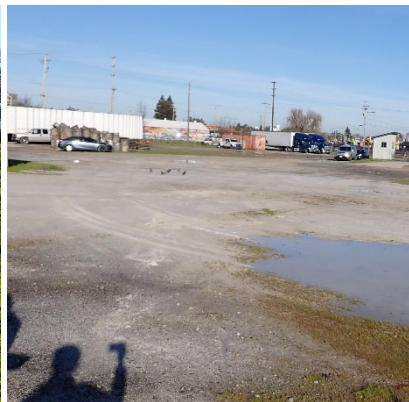


BIOLOGICAL RESOURCES TECHNICAL REPORT

OYSTER COVE MIXED USE DEVELOPMENT PROJECT

PETALUMA, SONOMA COUNTY, CALIFORNIA



Prepared for:

Kimley-Horn
10 South Almaden Blvd, Suite 1250
San Jose, CA 95113
Attn: Laura Worthington-Forbes
laura.worthington-forbes@kimley-horn.com

Prepared by:

WRA, Inc.
2169-G East Francisco Boulevard
San Rafael, CA 94901

Attn: Matt Richmond, Principal
richmond@wra-ca.com

Scott Yarger, Project Manager
yarger@wra-ca.com

WRA #30049
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LIST OF PREPARERS

Matt Richmond – Principal-in-Charge
 Scott Yarger – Associate Plant Biologist
 Brian Freiermuth – Senior Associate Wildlife Biologist
 Aedan McCluskey – Biologist
 Michael Rochelle – GIS Analyst

DEFINITIONS

Study Area: The area throughout which the assessment was performed, inclusive of approximately 11.2 acres of land and open water spanning across parcels APN 007-700-003-000, 007-700-006-000 and 007-700-005-000.

Project Area: The area encompassing the limit of disturbance of the proposed project and evaluated for potential impacts to sensitive biological resources; inclusive of approximately 6.0 acres.

LIST OF ACRONYMS

ADU	Accessory Dwelling Unit
BIOS	Biogeographic Information and Observation System
BRTR	Biological Resources Technical Report
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGF	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CSRL	California Soils Resources Lab
CTS	California Tiger Salamander
CWA	Clean Water Act
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
HTL	High Tide Line
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
Rank	California Rare Plant Ranks
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
SWRCB	State Water Resource Control Board
TOB	Top of Bank
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group
WRA	WRA, Inc.
RHA	Rivers and Harbors Act

1.0 INTRODUCTION

This Biological Resources Technical Report (BRTR) evaluates existing biological resources, potential impacts, and mitigation measures for the Oyster Cove Urban Mixed Use development project located at 100 and 310 East D Street, (APN 007-700-003-000, 007-700-006-000 and 007-700-005-000) in the city of Petaluma, Sonoma County, California (Figure 1, Appendix A). The proposed project involves the development of approximately six (6) acres of land (Project Area) into mixed uses including residential, commercial, office space, and public access open space. The area throughout which the assessment of biological resources was performed (Study Area) includes the entire Project Area, expanded to include a portion of the open water channel of the Petaluma River and McNear Channel which was assessed for potential development related impacts associated with the Project.

1.1 Overview and Purpose

This report provides an assessment of biological resources within the Study Area and potential impacts associated with the proposed project. The purpose of the assessment was to develop and gather information on sensitive biological communities and special-status plant and wildlife species to support an evaluation of the project under the California Environmental Quality Act (CEQA). This report describes the results of the site visit, which assessed the Study Area for: (1) the presence of sensitive biological communities, special-status plant species, and special-status wildlife species, (2) the potential for the site to support special-status plant and wildlife species. Based on the results of the site assessment, potential impacts to sensitive biological communities and special-status species resulting from the proposed project were evaluated. If the project has the potential to result in significant impacts to these biological resources, measures to avoid, minimize, or mitigate for those potentially significant impacts are described.

A biological resources technical report provides general information on the presence, or potential presence, of sensitive species and habitats. This assessment is based on information available at the time of the study and on-site conditions that were observed on the dates the site was visited. Conclusions are based on currently available information used in combination with the professional judgement of the biologists completing this study.

1.2 Project Description

The Oyster Cove Urban Mixed Use development project would redevelop portions of the Project Area, including a light industrial oyster shell processing plant, and develop previously undeveloped, vacant areas for residential, commercial, office, and open space uses. The project proposes the construction of 122 new three-story townhomes and ten live/work units as well as the renovation of one steel and timber structure as a combination of commercial and boat storage. A new public pedestrian and bike path connecting East D Street to the Petaluma River Park is also proposed. The townhomes and live/work units will vary in size from approximately 1,350 square feet to as much as 2,130 square feet and from three to four bedrooms. Certain units may also have optional Accessory Dwelling Units (ADUs).

In order to maximize public enjoyment of and access to this unique and underutilized site, the project proposes a reconfiguration of current circulation patterns such that vehicular traffic is relocated to the interior of the site, leaving the entire waterfront to be enjoyed by pedestrians and cyclists. The Project would convert the existing Copeland Street cul-de-sac into a proposed Oyster Cove Lane, and it would anchor prominent corners with commercial uses, linking the project to the downtown shopping district.

The Project would provide pedestrian, bike, and vehicle access, and facilitate public waterfront access to the Petaluma River and McNear Channel. Site drainage will include a network of storm drains, and bio-retention basins, and off-site drainage will require the construction of two stormwater outfall culverts and associated rip rap footings along the edges of McNear Channel and Petaluma River.

1.3 Summary of Results

This report details the regulatory background, methods, results, and recommendations of a BRTR (Biological Resources Technical Report) for the site located at 100 and 310 East D Street, (APN 007-700-003-000, 007-700-006-000 and 007-700-005-000) and immediate vicinity (Study Area). WRA, Inc. performed field surveys on January 11, 2022, and January 21, 2022. The Study Area is composed of mostly developed, landscaped, and/or disturbed land and ruderal herbaceous grassland that supports a preponderance of non-native grasses and forbs. Additionally, a portion of the bank, open water of tidal channels of the Petaluma River and McNear Channel and associated salt marsh fringe, are within the Study Area and those land cover types and aquatic resources are considered sensitive. Mitigation measures for potential impacts have been developed and provided herein to avoid or minimize impacts to the coastal marsh fringe and tidal channels. No other sensitive land cover and/or aquatic resources are present.

No special-status plant species were observed during any site visits, however one late-season special-status plant species which was not observable during the time of the survey, was determined to have a moderate potential for presence. Four special-status bats, one special status bird, and non-status birds with baseline legal protections have the potential to occur in the Study Area. Likewise, several special-status fish have the potential to occur in the Petaluma River. Critical Habitat for Federal-listed fish and Essential Fish Habitat (EFH) is present in the Petaluma River. Mitigation measures and best management practices have been developed and provided herein to avoid impacts to these resources.

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological resources technical report including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts. Table 1 shows the correlation between these regulations and each Biological Resources question in the Environmental Checklist Form (Appendix G) of the CEQA guidelines.

2.1 Federal and State Regulatory Setting

2.1.1 Vegetation and Aquatic Communities

CEQA provides protections for particular vegetation types defined as sensitive by the California Department of Fish and Game (CDFW), and aquatic communities protected by laws and regulations administered by the U.S Army Corps of Engineers (Corps), State Water Resources Control Board (SWRCB), and Regional Water Quality Control Boards (RWQCB). The laws and regulations that provide protection for these resources are summarized below.

Sensitive Natural Communities: Sensitive natural communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" (CDFW 2022a) and keeps records of their occurrences in its California Natural Diversity Database (CNDDb; CDFW 2022b). Vegetation alliances are ranked 1 through 5 in the CNDDb based on NatureServe's (2022) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). In addition, this general class includes oak woodlands that are protected by local ordinances under the Oak Woodlands Protection Act.

Waters of the United States, Including Wetlands: The Corps regulates "Waters of the United States" under Section 404 of the Clean Water Act (CWA). Waters of the United States are defined in the Code of Federal Regulations (CFR) as including the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, such as tributaries, lakes and ponds, impoundments of waters of the U.S., and wetlands that are hydrologically connected with these navigable features (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Unvegetated waters including lakes, rivers, and streams may also be subject to Section 404 jurisdiction and are characterized by an ordinary high water mark (OHWM) identified based on field indicators such as the lack of vegetation, sorting of sediments, and other indicators of flowing or standing water. The placement of fill material into Waters of the United States generally requires a permit from the Corps under Section 404 of the CWA.

The Corps also regulates construction in navigable waterways of the U.S. through Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403). Section 10 of the RHA requires Corps approval and a permit for excavation or fill, or alteration or modification of the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor or refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States. Section 10 requirements apply

only to navigable waters themselves, and are not applicable to tributaries, adjacent wetlands, and similar aquatic features not capable of supporting interstate commerce.

Waters of the State, Including Wetlands: The term “Waters of the State” is defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The SWRCB and nine RWQCB protect waters within this broad regulatory scope through many different regulatory programs. Waters of the State in the context of a CEQA Biological Resources evaluation include wetlands and other surface waters protected by the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2019). The SWRCB and RWQCB issue permits for the discharge of fill material into surface waters through the State Water Quality Certification Program, which fulfills requirements of Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a Clean Water Act permit are also required to obtain a Water Quality Certification. If a project does not require a federal permit but does involve discharge of dredge or fill material into surface waters of the State, the SWRCB and RWQCB may issue a permit in the form of Waste Discharge Requirements.

Sections 1600-1616 of California Fish and Game Code: Streams and lakes, as habitat for fish and wildlife species, are regulated by CDFW under Sections 1600-1616 of California Fish and Game Code (CFG). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). The term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). Riparian vegetation has been defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

2.1.2 Special-status Species

Endangered and Threatened Plants, Fish, and Wildlife. Specific species of plants, fish, and wildlife species may be designated as threatened or endangered by the federal Endangered Species Act (ESA), or the California Endangered Species Act (CESA). Specific protections and permitting mechanisms for these species differ under each of these acts, and a species’ designation under one law does not automatically provide protection under the other.

The ESA (16 USC 1531 et seq.) is implemented by the USFWS and the National Marine Fisheries Service (NMFS). The USFWS and NMFS maintain lists of endangered and threatened plant and animal species (referred to as “listed species”). “Proposed” or “candidate” species are those that are being considered for listing and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. “Take” under the ESA is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in take of an ESA-listed

species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federally listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features “essential to the conservation of the species”. Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

The CESA (CFGF 2050 et seq.) prohibits a take of any plant and animal species that the CFGF determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to candidate species which are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

Fully Protected Species and Designated Rare Plant Species. This category includes specific plant and wildlife species that are designated in the CFGF as protected even if not listed under CESA or ESA. Fully Protected Species includes specific lists of birds, mammals, reptiles, amphibians, and fish designated in CFGF. Fully protected species may not be taken or possessed at any time. No licenses or permits may be issued for take of fully protected species, except for necessary scientific research and conservation purposes. The definition of "take" is the same under the California Fish and Game Code and the CESA. By law, CDFW may not issue an Incidental Take Permit for Fully Protected Species. Under the California Native Plant Protection Act (NPPA), CDFW has listed 64 “rare” or “endangered” plant species, and prevents “take”, with few exceptions, of these species. CDFW may authorize take of species protected by the NPPA through the Incidental Take Permit process, or under a NCCP.

Special Protections for Nesting Birds and Bats. The federal Bald and Golden Eagle Protection Act provides relatively broad protections to both of North America’s eagle species (bald eagle [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*]) that in some regards are similar to those provided by the ESA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act of 1918 and CFGF, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act provides for conservation and management of fishery resources in the U.S., administered by NMFS. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g. eelgrass (*Zostera*

spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

Marine Mammals. The Marine Mammal Protection Act (MMPA) was enacted in 1972 and protects all marine mammals within the territorial boundaries of the United States from take. The definition of "take" in the MMPA is the same as that under the FESA. The law is administered by the NMFS, who may issue permits for incidental take and importation of marine mammals in certain circumstances.

Species of Special Concern, Movement Corridors, and Other Special-status Species under CEQA. To address additional species protections afforded under CEQA, CDFW has developed a list of special species as "a general term that refers to all of the taxa the CNDDDB is interested in tracking, regardless of their legal or protection status." Plant species on the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (Inventory) with California Rare Plant Ranks (Rank) of 1 and 2, as well as some with a Rank of 3, are also considered special-status plant species and must be considered under CEQA. Some Rank 3 species and all Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. Additionally, any species listed as sensitive within local plans, policies and ordinances are likewise considered sensitive. Movement and migratory corridors for native wildlife (including aquatic corridors) as well as wildlife nursery sites are given special consideration under CEQA.

2.2 Local Plans and Policies

City of Petaluma General Plan. The City of Petaluma's General Plan contains policies pertaining to the biology and natural resources that apply to the Project. Chapter 4.1, "Biology and Natural Resources", identifies aquatic and riparian resources, sensitive vegetation types, and sensitive species and habitats to designate for protection. General Plan policies 4-P-1 through 4-P-3 may apply to the Project. These policies include:

- Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy (4-P-1);
- Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation (4-P-2);
- Protect special status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare (4-P-3);

City of Petaluma Tree Ordinance: The City of Petaluma recognizes the aesthetic, environmental, and economic benefits that mature trees provide to the citizens of the City. Chapter 17, "Tree Preservation," of the Petaluma City Code (Tree Ordinance) regulates the protection of certain trees on public and private properties within the City limits. The Tree Ordinance defines a "protected tree" as California native oaks (*Quercus* spp.) 4 inches diameter or greater measured at 4.5 above grade ("diameter at breast height" or DBH), California buckeye (*Aesculus californica*) 6 inches DBH or greater, California bay (*Umbellularia californica*) 12 inches DBH or greater, coast redwood (*Sequoia sempervirens*) 18 inches DBH or greater, heritage trees as approved by Council resolution per Title 8 of the Petaluma Municipal Code, significant groves or stands of trees, trees located in riparian corridors, any tree required to be planted or preserved as mitigation or condition of approval for a discretionary development project, or trees in the public right-of-way. A permit is generally required for the removal of any protected tree. Conditions of approval may include tree replacement plantings or the payment of in-lieu fees.

3.0 ASSESSMENT METHODOLOGY

On January 11, 2022 and January 21, 2022 WRA, Inc. (WRA) biologists visited the Study Area to map vegetation, aquatic resources, unvegetated land cover types, document plant and wildlife species present, and evaluate on-site habitat conditions for the potential to support special-status species as defined by CEQA. Prior to the site visit, WRA biologists reviewed literature resources and performed database searches to assess the potential for sensitive vegetation communities (e.g. native grasslands), aquatic resources (e.g., wetlands), and special-status species (e.g., endangered plants), including:

- Soil Survey of Sonoma County, California (USDA 1972)
- Petaluma 7.5-minute U.S. Geological Survey (USGS) quadrangle (USGS 2018)
- Contemporary aerial photographs (Google Earth 2022)
- Historical aerial photographs (NETR 2022)
- National Wetlands Inventory (USFWS 2022a)
- California Aquatic Resources Inventory (SFEI 2017)
- CNDDDB (CDFW 2022b)
- CNPS Inventory (CNPS 2022a)
- Consortium of California Herbaria (CCH1 2022, CCH2 2022)
- USFWS List of Federal Endangered and Threatened Species (USFWS 2022b)
- eBird Online Database (eBird 2022)
- CDFW Publication, California Bird Species of Special Concern in California (Shuford and Gardali 2008)
- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- A Manual of California Vegetation, Online Edition (CNPS 2022b)
- Preliminary Descriptions of the Terrestrial Natural Communities (Holland 1986)
- California Natural Community List (CDFW 2022a)

Database searches (i.e., CNDDDB, CNPS) for special-status species focused on the Petaluma, and eight surrounding USGS 7.5-minute quadrangles, including: Two Rock, Cotati, Glen Ellen, Point Reyes NE, Petaluma River, Inverness, San Geronimo, Novato. The special-status wildlife evaluation was based on database searches for the entirety of Sonoma County.

Following the remote assessment, WRA biologists completed a field review over the course of 2 days and 16 person hours to document: (1) land cover types (e.g., terrestrial communities, aquatic resources), (2) existing conditions and to determine if such provide suitable habitat for any special-status plant or wildlife species, (3) if and what type of aquatic natural communities (e.g., wetlands) are present, and (4) if special-status species are present¹.

3.1 Vegetation Communities and Other Land Cover Types

During the site visit, WRA evaluated the species composition and area occupied by distinct vegetation communities, aquatic communities, and other land cover types. Mapping of these classifications utilized

¹ Due to the timing of the assessment, it may or may not constitute protocol-level species surveys; see Section 5.2 if the site assessment would constitute a formal or protocol-level species survey.

a combination of aerial imagery and ground surveys. In most instances, communities are characterized and mapped based on distinct shifts in plant assemblage (vegetation) and follow the California Natural Community List (CDFW 2022a) and A Manual of California Vegetation, Online Edition (CNPS 2022b). These resources cannot anticipate every component of every potential vegetation assemblage in California, and so in some cases, it is necessary to identify other appropriate vegetative classifications based on best professional judgment of WRA biologists. When undescribed variants are used, it is noted in the description. Vegetation alliances (natural communities) with a CDFW Rank of 1 through 3 (globally critically imperiled [S1/G1], imperiled [S2/G2], or vulnerable [S3/G3]) (CDFW 2022a), were evaluated as sensitive as part of this evaluation.

The site was reviewed for the presence of wetlands and other aquatic resources according to the methods described in the *Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987)*, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* (Corps 2008). Areas meeting these indicators were mapped as aquatic resources and categorized using the vegetation community classification methods described above. The presence of riparian habitat was evaluated based on woody plant species meeting the definition of riparian provided in *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607, California Fish and Game Code* (CDFG 1994) and based on best professional judgement of biologists completing the field surveys.

3.2 Special-status Species

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database review as described above. Presence of suitable habitat for special-status species was evaluated during the site visits based on physical and biological conditions of the site as well as the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then determined according to the following criteria:

- No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- Present. Species is observed on the site or has been recorded (i.e. CNDDDB, other reports) on the site in the recent past.

If a more thorough assessment was deemed necessary, a targeted or protocol-level assessment or survey was conducted or recommended as a future study. If a special-status species was observed during the

site visit, its presence was recorded and discussed below in Section 5.2. If designated critical habitat is present for a species, the extent of critical habitat present and an evaluation of critical habitat elements is provided as part of the species discussions below.

3.2.1 Special-status Plants

A general assessment for special-status plants was conducted within the Study Area on January 11, 2022. The survey assessed the habitat within the Study Area to determine if any special-status plants have the potential to occur. All plants observed were noted and are shown in Appendix B. Plants were identified using *The Jepson Manual, 2nd Edition* (Baldwin et. al. 2012), *A Flora of Sonoma County* (Best et. al. 1996), and Jepson Flora Project (eFlora 2022, to the taxonomic level necessary to determine whether or not they were sensitive. Plant names follow those of Jepson Flora Project (eFlora 2022), unless otherwise noted.

3.2.2 Special-status Wildlife

The general assessment for special-status wildlife was conducted for the Study Area on January 21, 2022. The existing conditions within the Study Area were assessed to determine if any special-status wildlife have the potential to occur.

3.3 Wildlife Corridors and Native Wildlife Nursery Sites

To account for potential impacts to wildlife movement/migratory corridors, biologists reviewed maps from the California Essential Connectivity Project (CalTrans 2010), and habitat connectivity data available through the CDFW Biogeographic Information and Observation System (BIOS; CDFW 2020). Additionally, aerial imagery (Google Earth 2022) for the local area was referenced to assess if local core habitat areas were present within, or connected to the Study Area. This assessment was refined based on observations of on-site physical and/or biological conditions, including topographic and vegetative factors that can facilitate wildlife movement, as well as on-site and off-site barriers to connectivity.

The potential presence of native wildlife nursery sites is evaluated as part of the site visit and discussion of individual wildlife species below. Examples of native wildlife nursery sites include nesting sites for native bird species (particularly colonial nesting sites), marine mammal pupping sites, and colonial roosting sites for other species (such as for monarch butterfly [*Danaus plexippus*]).

4.0 ECOLOGICAL SETTING

The approximately 11.2-acre Study Area is located in downtown Petaluma, Sonoma County, California (Figure 1, Appendix A). The Study Area parcels are situated between the Petaluma River to the south, the Sonoma-Marin Area Rapid Transit (SMART) tracks to the north, McNear Channel and McNear Peninsula to the east, and East D Street to the west. Public access parcels extend further southeast from the Study Area along McNear peninsula, designated as Steamer Landing Park. The Study Area is accessed from East D Street onto Copeland Street, which intersects the parcels and ends in a public parking lot along the shore of McNear Channel. Additional details of the local setting are below.

4.1 Soils and Topography

The overall topography of the Study Area is flat, with slopes of less than one percent, and elevations ranging from approximately 12 to 16 feet above sea level. According to the *Soil Survey of Sonoma County* (USDA 1972), the Study Area is underlain by two mapping units consisting of one soil type, Clear Lake clay, sandy substratum, drained, 0 to 2 percent slope; and tidal marsh. Soils within the Study Area are shown in Appendix A – Figure 2. The parent soil series of the Study Area’s mapping units are summarized below.

Clear Lake Series. This series consists of very deep clay soils formed in alluvium derived from sedimentary rock and are located on basin floors of river valleys at elevations ranging from 25 to 2,000 feet (CSRL 2022, USDA 1972). These soils are considered hydric, and are poorly drained, with negligible to high runoff, and slow to very slow permeability (USDA 2022b, USDA 1972). Soil pH is neutral (pH 7.0) to moderately alkaline (pH 8.0). Native and naturalized vegetation is composed of grasses and forbs, and land uses include row cropping, dry farming, irrigated pasture, and dry pasture (USDA 1972).

4.2 Climate and Hydrology

The Study Area is located within the valley fog incursion zone of Sonoma County where summer temperatures are buffeted by fog and fog drip contributes to annual rainfall totals. Winter “tule” fog is common, and summer “coastal” fog emerges with increased interior temperatures. The average monthly maximum temperature of Petaluma (047965) is 70.4 degrees Fahrenheit, while the average monthly minimum temperature is 44.9 degrees Fahrenheit. Predominantly, precipitation falls as rainfall with an annual average of 24.9 inches. Precipitation-bearing weather systems are predominantly from the west and south with the majority of rain falls between November and March, with a combined average of 20.9 inches (USDA 2022a).

The local watersheds are Adobe Creek-Frontal San Pablo Bay Estuaries (HUC 12: 180500020605) and San Pablo Bay Estuaries (HUC 12: 180500020802); the regional watershed is San Pablo Bay (HUC 8: 18050002). The nearest blue-line stream is Petaluma River, bordering parcel 007-700-006 to the south, and the McNear Channel, butting into parcels 007-700-006 and 007-700-005 from the southeast. The Petaluma River is the only mapped blue-line streams on the 7.5-minute quadrangle within the Study Area (USGS 2018); however, there are no existing wetlands or other aquatic resources mapped in the CARI (SFEI 2017) and NWI (USFWS 2022a) databases.

4.3 Land-use

The Study Area south of Copeland Street consist of mostly light industrial development, while to the north the land consists of undeveloped ruderal grassland. However, review of historic aerial imagery (NETR

2022) shows that nearly the entirety of the Study Area had been previously developed for industrial uses. A former railroad spur serviced an industrial facility on the northern parcel, as shown on a 1952 aerial image, and between 1952 and 1968 those facilities were demolished, and the site underwent substantial modifications, including re-contouring of the shoreline of McNear Channel.

There are three structures currently occupying the Study Area, all of which exist on the southern parcel. The largest building has existed along the Petaluma River since the mid-20th Century and is still being commercially used today. The developed areas consist of pavement, compacted soil, gravel, and oyster shell, and temporary structures. The parcel to the north of Copeland Street is less developed, consisting of ruderal herbaceous grassland. Between this parcel and McNear Channel sits an existing city parking lot and paved public trail with sparse ornamental, landscaped trees (Google Earth 2022). At the time of the site visits, a population of unhoused individuals was using this stretch of trail along the McNear Channel. The boundary of McNear Channel, where it ends along these parcels, was historically expanded approximately 100 feet further inland with more industrial structures, since removed, lining the shore (NETR 2022).

As the Study Area is located in central Petaluma, development in the immediate vicinity around the parcels has been present since the late 1800's. This historic condition along with its topographic position, soil types, and localized climate create the conditions for an herbaceous non-native vegetation community, dominated by non-native species tolerant of disturbance. Detailed plant community descriptions are provided in Section 5.1. and all observed plant species are included in Appendix B.

5.0 ASSESSMENT RESULTS

5.1 Vegetation Communities and Other Land Cover

WRA observed four land cover types within the Study Area: developed/disturbed, ruderal herbaceous grassland, coastal salt marsh (fringe), and open water. Land cover types within the Study Area are illustrated in Figure 3 (Appendix A). The non-sensitive land cover types in the Study Area include barren/disturbed, ruderal, and developed, while the only sensitive community are coastal salt marsh fringe and open water.

TABLE 1. VEGETATION COMMUNITY AND LAND COVER TYPES

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING	ACRES WITHIN STUDY AREA
<i>Terrestrial Community/Land Cover</i>			
Developed/landscaped/disturbed	Non-sensitive	None	4.453
Ruderal herbaceous grassland	Non-sensitive	None	3.754
<i>Aquatic Resources</i>			
Coastal salt marsh fringe	Sensitive	N/A	0.581
Tidal waters	Sensitive	N/A	2.486

5.1.1 Terrestrial Land Cover

Developed/landscaped/disturbed (no vegetation alliance). CDFW Rank: None. Developed, landscaped, and disturbed areas within the Study Area consist of previously developed structures, paved areas, associated landscaping, and otherwise disturbed areas such as compacted gravel areas used for parking. A total of 4.453 acres of developed/landscaped/disturbed areas are present within the Study Area. These areas have been previously converted and/or disturbed by development, motorized vehicle activity, and storage of equipment. Vegetation within these areas consists of non-native landscaped shrubs such as ornamental rose (*Rosa* sp.), ornamental and native planted trees including coast live oak (*Quercus agrifolia*), and London plane (*Platanus x acerifolia*), and non-native grasses and forbs. This land cover type is not considered sensitive, but it may contain habitat for common nesting bird species.

Ruderal herbaceous grassland (*Avena* spp. – *Bromus* spp. Herbaceous Semi-natural alliance). CDFW Rank: None. Ruderal herbaceous grassland areas within the Study Area consist of undeveloped semi-natural areas dominated by non-native weedy herbaceous plants, i.e. grasses and forbs. A total of 3.754 acres of ruderal herbaceous grassland is present within the Study Area within the parcel north of Copeland Street. This vegetation community within the Study Area is dominated by non-native invasive annual grasses including slim oat (*Avena barbata*), and riggut brome (*Bromus diandrus*), with occasional non-native perennial Harding grass (*Phalaris aquatica*) intermixed, and mostly non-native forbs present including bur clover (*Medicago polymorpha*), English plantain (*Plantago lanceolata*), wild geranium (*Geranium dissectum*), cheeseweed (*Malva* spp.), filaree (*Erodium cicutarium*, *E. moschatum*), and short-podded mustard (*Hirschfeldia incana*). The vegetation composition, and recent aerial imagery (Google Earth 2022) indicates recent and past disturbance from mowing and/or discing which have altered conditions from native/natural which may support native species to disturbed conditions which no longer support most native species. This land cover covers the northern parcel in the Study Area.

5.1.2 Aquatic Resources

Coastal salt marsh fringe (*Salicornia pacifica* [*Salicornia depressa*] Herbaceous Alliance) Section 404/401 of the CWA; Porter-Cologne Water Quality Control Act. The Study Area contains approximately 0.581 acres of coastal salt marsh associated with the tidal channels of the Petaluma River and McNear Channel. These tidally influenced wetland areas are dominated by pickleweed (*Salicornia pacifica*), salt grass (*Distichlis spicata*), and gumweed (*Grindelia stricta*), with cord grass (*Spartina sp.*) present at lower emergent elevation. Along the Petaluma River shoreline, the top of bank (TOB) is approximately 8 to 10 feet above the high tide line (HTL) with a steep slope of upland grasses between. Along the HTL, there is a 6 inch to 1.5 foot band of coastal salt marsh vegetation comprising this community. Developed features along the shoreline include two wooden docks and a 12-inch diameter PVC outfall culvert. The shoreline of the McNear Channel is similar in appearance to the Petaluma River, with a slightly less steep bank, and a greater extent of salt marsh fringe. One 3-foot diameter stormwater outfall culvert exists on the northernmost bank. Abundant anthropogenic debris and waste items are present at the outfall. The coastal salt marsh fringe ranges in width from 6 inches wide to 4 feet wide along McNear Channel. Coastal salt marsh fringe is considered a jurisdictional wetland subject per Section 404/401 of the CWA, and the Porter-Cologne Water Quality Control Act.

Tidal waters (no vegetation alliance). Section 404/401 of the CWA; Section 10 of the Rivers and Harbors Act; Porter-Cologne Water Quality Control Act. The Study Area contains approximately 2.486 acres of tidal channel open water associated with the Petaluma River, and McNear Channel. The Petaluma River is located along the southern edge of the Study Area, and McNear Channel, a tidal inlet is located at the eastern edge of the Study Area. The tidal channels are hydrologically connected downstream outside of the Study Area, southeast of the McNear Peninsula, and both channels are tidally influenced. Both channels are considered traditionally navigable waters subject to Section 404/401 of the CWA, the RHA, Porter-Cologne Water Quality Control Act, and CFGC Section 1600-1616.

5.2 Special-status Species

5.2.1 Special-status Plants

Based upon a review of the resource databases listed in Section 3.0, 99 special-status plant species have been documented in the vicinity of the Study Area. One of these plants have the potential to occur in the Study Area as they are adapted to highly disturbed areas. The remaining 98 species documented from the greater vicinity are unlikely or have no potential to occur for one or more of the following:

- Edaphic (soil) conditions (e.g., volcanic tuff, serpentine) necessary to support the special-status plant species are not present in the Study Area;
- Topographic conditions (e.g., north-facing slope, montane) necessary to support the special-status plant species are not present in the Study Area;
- Unique pH conditions (e.g., alkali scalds, acidic bogs) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., chaparral, cismontane woodland) necessary to support the special-status plant species are not present in the Study Area;

- The Study Area is geographically isolated (e.g. below elevation, coastal environ) from the documented range of the special-status plant species;
- The historical landscape and/or habitat(s) of the Study Area were not suitable habitat prior to land/type conversion (e.g., reclaimed shoreline) to support the special-status plant species;
- Land use history and contemporary management (e.g., compacted soils, grading, intensive grazing) has degraded the localized habitat necessary to support the special-status plant species.

The following special-status plant is determined to have the potential to occur within the Study Area based on database searches discussed above.

Pappose tarplant (*Centromadia parryi* ssp. *parryi*). CRPR 1B. **Moderate Potential**. Pappose tarplant is an annual herb in the sunflower family (Asteraceae) that blooms from May to November. It typically occurs in vernal mesic, often alkaline areas in coastal prairie, meadow, seep, coastal salt marsh, and valley and foothill grassland habitat, and disturbed areas such as roadsides at elevations ranging from 5 to 1380 feet (CDFW 2022a, CNPS 2022a). This species is determined to have the potential to occur in the Study Area due to presence of disturbed grassland, known ability to occur in highly disturbed areas, and the documented occurrence of a similar non-rare species, common tarweed (*Centromadia pungens* ssp. *pungens*) in the immediate vicinity of the Study Area.

5.2.2 Special-status Wildlife

Based upon a review of the resource databases listed in Section 3.0, 69 special-status wildlife species have been recorded in the vicinity of the Study Area. Appendix B summarizes the potential for each of these species to occur in the Study Area. No special-status wildlife species were observed in the Study Area during the site assessment, no special-status wildlife species has a high potential to occur in the Study Area, and eleven special-status wildlife species have a moderate potential to occur in the Study Area; these species are discussed below.

The remaining species are unlikely or have no potential to occur due to one or more of the following reasons:

- Aquatic habitats (e.g., vernal pools, ponds) necessary to support the special-status wildlife species are not present in the study area;
- Vegetation habitats (e.g., coast redwood forest, oak woodland) that provide nesting and/or foraging resources necessary support the special-status wildlife species are not present in the study area;
- Physical structures and vegetation (e.g., mines, old-growth coniferous trees) necessary to provide nesting, cover, and/or foraging habitat to support the special-status wildlife species are not present in the study area;
- Host plants necessary to provide larval and nectar resources for the special-status wildlife species are not present in the study area;
- The study area is outside (e.g., north of, west of) of the special-status wildlife species documented nesting range.

Because of frequent, persistent human disturbance and presence, the site offers limited value for most special-status wildlife species that may occur in the vicinity. With development, roads, open water, and chain link fencing surrounding and within the Study Area, the site is relatively inaccessible to many species and eliminates the possibility of the site functioning as a movement corridor. The ruderal field that comprises half of the Study Area offers little to no cover and meets few habitat requirements for most special-status species. No special-status wildlife species were observed, and no special-status species have been documented to occur in the Study Area.

The following special-status wildlife were determined to have a potential to occur in the Study Area based on evaluation of the habitat in and near the Study Area and review of literature and databases. For further discussions of special-status species potentially present or unlikely to be present, see Appendix C. Recommendations to avoid impacts to special-status species and nesting birds in general, are described in Section 7.1.2 this assessment.

TABLE 2. POTENTIAL SPECIAL-STATUS WILDLIFE

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS	POTENTIAL HABITAT IN THE STUDY AREA
<i>Acipenser medirostris</i>	Green sturgeon	Federal Threatened, SSC	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is Critical Habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration, or use the Study Area to forage.
<i>Acipenser transmontanus</i>	White sturgeon	SSC	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration, or use the Study Area to forage.
<i>Antrozous pallidus</i>	Pallid Bat	SSC, WBWG High Priority	Moderate Potential. The Study Area does contain trees suitable to provide roosting of this species. Additionally this species was documented in a building less than a mile from the Study Area (CDFW 2022b).
<i>Corynorhinus townsendii townsendii</i>	Townsend's western big-eared bat	SSC, WBWG High	Moderate Potential. The Study Area contains structures that may provide roosting habitat for this species.
<i>Elanus leucurus</i>	White-tailed kite	State Fully Protected	Moderate Potential. Trees within the vicinity of the Study Area could support nesting for this species. This species may be seen foraging within the Study Area.
<i>Entosphenus [=Lampetra] tridentatus</i>	Pacific lamprey	SSC	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide

			suitable spawning habitat, this species has a potential to occur during migration.
<i>Lampetra ayresi</i>	River lamprey	SSC	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration.
<i>Myotis thysanodes</i>	Fringed myotis	WBWG High	Moderate Potential. The Study Area contains some structures that may support roosting.
<i>Myotis volans</i>	Long-legged myotis	WBWG High	Moderate Potential. The Study Area contains some structures that may support roosting.
<i>Oncorhynchus mykiss irideus</i>	Steelhead	Federal Threatened	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is Critical Habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a moderate potential to occur during migration, or use the Study Area to forage. The nearest documented occurrence is 3 miles east of the Study Area (CDFW 2022b).
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	SSC	Moderate Potential. This species has been documented within the vicinity of the Study Area in the Petaluma River (CDFW 2022b). Although the Study Area does not contain flooded vegetation required for spawning, this species may forage in the riverine portion of the Study Area.

Green sturgeon (*Acipenser medirostris*); Federal Threatened, CDFW Species of Special Concern. Moderate Potential The southernmost spawning population of green sturgeon is in the Sacramento River, with the principal spawning area located in the lower Feather River (Moyle 2002). Spawning populations of green sturgeon in the San Joaquin River are presumed to have been lost in the past 25-30 years. Green sturgeon are primarily marine species, entering into fresh water rivers mainly to spawn, although early life stages may reside in freshwater for up to two years (Moyle 2002). Adults typically migrate into fresh water from late February through late July. The spawning period occurs from March to July, with peak spawning occurring from mid-April to mid-June (Emmett et al. 1991). Green sturgeon prefer deep pools in large, turbulent, freshwater river mainstems to spawn (Moyle et al. 1992). Juvenile green sturgeon emigrate out to sea primarily during the summer and fall before the end of their second year (Emmett et al. 1991). Green sturgeon adults, sub-adults, and juveniles are widely distributed throughout the Delta and estuary. Adults typically migrate upstream on the western edge of the Delta, returning to the ocean when river temperatures decrease and flows increase during the fall and early winter. They may hold in low gradient or off-channel sloughs or coves where temperatures are within acceptable thresholds. Larvae prefer open aquatic habitats for foraging, but utilize structure habitat during the day. Juvenile rearing habitats for

green sturgeon include spawning areas and migration corridors. Rearing habitat utilization varies dependent on seasonal flows and temperatures. Juvenile green sturgeon are found year round in the Delta and use the region as a migration corridor, feeding area, and juvenile rearing area. Juvenile green sturgeon are strong swimmers and thus have the ability to select or avoid habitats. The Petaluma River is a tributary to the San Pablo Bay, ESA designated critical habitat for this species. The Study Area does not contain suitable spawning habitat, but does provide potential habitat for foraging of juvenile and adult green sturgeon within the Petaluma River.

White sturgeon (*Acipenser transmontanus*), CDFW Species of Special Concern. Moderate Potential. This sturgeon is found in most estuaries along the Pacific coast, and are known to the San Francisco Bay Estuary. Adults in the San Francisco Bay Estuary system spawn in the Sacramento River and are not known to enter freshwater or non-tidal reaches of Estuary streams. White sturgeon typically spawn in May through June. The diet consists of crustaceans, mollusks, and some fish. White sturgeon have been known to be captured by anglers downstream of the Study Area and may occasionally forage within it. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration, or use the Study Area to forage.

Pallid Bat (*Antrozous pallidus*), CDFG Species of Special Concern, WBWG High Priority. Moderate Potential. Pallid bats occur in a number of habitats ranging from rocky arid deserts to grasslands and higher elevation coniferous forests. They are most abundant in the arid Sonoran life zones below 6,000 feet. Pallid bats often roost in colonies of between 20 and several hundred individuals. Roosts are typically in rock crevices, tree hollows, mines, caves, and a variety of man-made structures, including vacant and occupied buildings. Tree roosting has been documented in large conifer snags (e.g., ponderosa pine), inside basal hollows of redwoods and giant sequoias, and within bole cavities in oak trees. Pallid bats are primarily insectivorous, feeding on large prey that is taken on the ground, or sometimes in flight. Prey items include arthropods such as scorpions, ground crickets, and cicadas (WBWG 2021).

Trees within and adjacent to the Study Area may provide suitable roosting habitat for pallid bats and a nearby occurrence has been recorded. Additionally, the Petaluma River and open areas within the Study Area provide suitable foraging habitat for this species, therefore it is determined that this species has a moderate potential to occur within the Study Area.

Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*), CDFW Species of Special Concern, WBWG High Priority. Moderate Potential. This species ranges throughout western North America from British Columbia to central Mexico. Its local distribution is strongly associated with the presence of caves but roosting also occurs within man-made structures including mines and buildings. While many bat species wedge themselves into tight cracks and crevices, big-eared bats hang from walls and ceilings in the open. Males roost singly during the spring and summer months while females aggregate in the spring at maternity roosts to give birth. Females roost with their young until late summer or early fall, until the young become independent, flying and foraging on their own. In central and southern California, hibernation roosts tend to be made up of small aggregations of individuals (Pierson and Rainey 1998). Foraging typically occurs along edge habitats near streams and wooded areas, where moths are the primary prey (WBWG 2021). The Study Area contains structures that may provide roosting habitat for this species, thus there is moderate potential for the species to occur.

White-tailed kite (*Elanus leucurus*), CDFW Fully Protected Species. Moderate Potential. White-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including

grasslands, savannahs, woodlands, agricultural areas, and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates. Trees in and adjacent to the Study Area may provide marginal nesting habitat; however, high levels of human disturbance may deter individuals from nesting in the vicinity. The Study Area provides foraging habitat and there are trees suitable for nesting within the vicinity; therefore there is a moderate potential for this species to occur.

Pacific lamprey (*Entosphenus [=Lampetra] tridentatus*), CDFW Species of Special Concern. Moderate Potential. This anadromous lamprey is found along the entire California coast with regularity until becoming disjunct south of San Luis Obispo County with the exception of regular runs to the Santa Clara River. With the exception of land-locked populations, this species spends the predatory phase of its life in the ocean, feeding off the bodily fluids of a variety of fish. This species is usually concentrated near the mouths of their spawning streams because its prey is most abundant in coastal areas. Adults move up into spawning streams between early March and late June. After hatching, ammocetes are washed downstream, where they burrow into soft substrates and filter feed. Five to seven years later, ammocetes undergo metamorphosis into the predatory phase of their life cycle, and out-migrate to the ocean as adults. This species may occur in the Petaluma River portion of the Study Area.

River lamprey (*Lampetra ayresi*), CDFW Species of Special Concern. Moderate Potential. River lampreys prey upon a variety of fishes in the 10-30 cm TL size range, but the most common prey seem to be herring and salmon. Unlike other species of lamprey in California, river lampreys typically attach to the back of the host fish, above the lateral line, where they feed on muscle tissue. Little is known about habitat requirements in California, but presumably, the adults need clean, gravelly riffles in permanent streams for spawning, while the ammocetes require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 25°C. Adults migrate back into fresh water in the fall and spawn during the winter or spring months in small tributary streams. The Petaluma River portion of the Study Area may support river lamprey.

Fringed myotis (*Myotis thysanodes*), WBWG High Priority. Moderate Potential. The fringed myotis ranges throughout much of western North America from southern British Columbia to southern Mexico. This species is most common in drier woodlands (e.g. oaks, pinyons-junipers); a variety of other habitats are used including desert scrubland, grassland, and coniferous and mixed (coniferous-deciduous) forests. Maternity roosting occurs in colonies of 10 to 2,000 individuals, although large colonies are rare (WBWG 2021). Caves, buildings, mines, rock crevices in cliff faces, and bridges are used for maternity and night roosts; tree cavities/hollows are also commonly used (WBWG 2021). The Study Area contains some structures that may support roosting, thus this species has moderate potential to occur.

Long-legged myotis (*Myotis volans*), WBWG High Priority. Moderate Potential. The long-legged myotis ranges across western North America from southeastern Alaska to Baja California and east to the Great Plains and central Texas. This species is usually found in coniferous forests, but also occurs seasonally in riparian and desert habitats. They use abandoned buildings, cracks in the ground, cliff crevices, exfoliating tree bark and hollows within snags as summer day roosts. Caves and mines are used as hibernation roosts. Long-legged myotis forage in and around the forest canopy and feed on moths and other soft-bodied insects (WBWG 2021). The Study Area contains some structures that may support roosting, thus this species has moderate potential to occur.

Steelhead – Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened, Species under the Jurisdiction of the NMFS. Moderate Potential. The Central California Coast DPS includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending two years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4-or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. The portion of the Study Area that will be within the Petaluma River has the potential to support various life stages of steelhead and therefore is determined to have a moderate potential to occur within the Study Area. The Petaluma River is designated as ESA critical habitat for this species.

Sacramento splittail (*Pogonichthys macrolepidotus*), CDFW Species of Special Concern, Species included in a USFWS Recovery Plan or Draft Recovery Plan. Moderate Potential. Splittails are primarily freshwater fish that have been found mostly in slow-moving sections of rivers and sloughs, and in the Delta and Suisun Marsh they seemed to congregate in dead-end sloughs (Moyle et al. 1982, Daniels and Moyle 1983). Splittail are benthic foragers that feed extensively on opossum shrimp (*Neomysis mercedis*) but also eat a variety of other invertebrates (worms, clams, insect larvae) as well as detrital material. . This species is preyed on by striped bass and other predatory fishes. Splittails apparently require flooded vegetation for spawning and as foraging areas for young, and hence are found in habitats subject to periodic flooding during the breeding season (Caywood 1974). Although the Study Area does not contain suitable flooded vegetated habitat to support spawning or foraging for young, this species may occur within the Study Area it provides foraging habitat. The nearest documented occurrence is 0.5 mile north of the Study Area (CDFW 2022b).

5.3 Wildlife Corridors and Native Wildlife Nursery Sites

A review of the California essential connectivity project (CDFW 2020) showed that the Study Area is not located within areas previously identified as an essential connectivity area, core reserve or corridor, landscape block, or general wildlife corridors identified in the BIOS system. The Petaluma River serves a conduit for several species of special-status fish as they transit from one habitat type to another; as such the Petaluma River is a wildlife corridor, however no impacts to the Petaluma River's quality as a corridor will result from the Project and no measures are necessary to maintain the Petaluma River's quality as a wildlife corridor.

After conducting the site assessment, and evaluating species potential, the Study Area was determined to have no potential to function as a wildlife corridor for terrestrial species because of the extent and density of surrounding development and associated infrastructure which create barriers to movement and lack of aquatic features (or other conveyance corridors) that would facilitate movement between habitats. Movement between two core habitats defines a wildlife corridor; therefore, because the Study Area does not facilitate movement between core habitats, it cannot be defined as a wildlife corridor. No further recommendations are made to address wildlife movement.

Critical Habitat

Critical habitat for green sturgeon, coho salmon and steelhead salmon are present in the Petaluma River, however, significant adverse changes to the extent or quality of critical habitat will not result from the project and no measures specific to critical habitat are recommended.

Essential Fish Habitat

Essential Fish Habitat is located within the Study Area. However, no changes to the extent or quality of EFH will occur as a result of the Project.

Wildlife Nursery Sites

No native wildlife nursery sites are present in the Study Area.

6.0 ANALYTICAL METHODOLOGY AND SIGNIFICANCE THRESHOLD CRITERIA

Pursuant to Appendix G, Section IV of the State CEQA Guidelines, a project would have a significant impact on biological resources if it would:

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

These thresholds were utilized in completing the analysis of potential project impacts for CEQA purposes. For the purposes of this analysis, a “substantial adverse effect” is generally interpreted to mean that a potential impact could directly or indirectly affect the resiliency or presence of a local biological community or species population. Potential impacts to natural processes that support biological communities and special-status species populations that can produce similar effects are also considered potentially significant. Impacts to individuals of a species or small areas of existing biological communities may be considered less than significant if those impacts are speculative, beneficial, de minimis, and/or would not affect the resiliency of a local population.

7.0 IMPACTS AND MITIGATION EVALUATION

Using the CEQA analysis methodology outlined in Section 6 above, the following section describes potential significant impacts to sensitive resources within the Study Area (inclusive of Project Area) as well as suggested mitigation measures which are expected to reduce impacts to less than significant.

7.1 Special-status Species

This section analyzes the Project's potential impacts and mitigation for special-status species in reference to the significance threshold outlined in CEQA Appendix G, Part IV (a):

Does the project have the potential to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Potential impacts and mitigation for potentially significant impacts are discussed below.

7.1.1 Special-status Plant Species

Potential Impact BIO-1: The Project Area contains a ruderal herbaceous grassland, a semi-natural vegetation alliance that consists of predominantly non-native grasses and forbs. This community has been historically and persistently disturbed by discing, mowing, or other anthropogenic disturbances, and is therefore unlikely to support most special-status plant species. However, there is moderate potential for one disturbance-tolerant special-status plant species, pappose tarplant, to occur within the Project Area. While no documented occurrences of this species are known within the Project Area, there is moderate potential that development could adversely impact a special-status plant if found present.

Mitigation Measure BIO-1: A protocol-level late season plant survey (May, June, or July) shall be conducted to determine presence or absence of pappose tarplant. If any special-status plants are found to be present, a census of the population and mapping of outward extent shall be performed. These plants shall be avoided to the greatest extent feasible, however, if impacts are unavoidable, a plan that will replace the plants shall be developed which will restore impacted species in a suitable habitat on or off site within an equal area and/or in equal population numbers determined prior to the impact. The plan shall also include a monitoring and reporting program to determine success that shall be met to the satisfaction of the City of Petaluma and regulatory agencies.

7.1.2 Special-status Wildlife Species

The Study Area has the potential to support eleven special-status wildlife species. Additionally, the Study Area is within designated critical habitat for green sturgeon and steelhead. The following mitigation measures are provided to avoid or otherwise minimize potential impacts to these species.

Potential Impact BIO-2: Four special-status bats (pallid bat, Townsend's western big-eared bat, fringed myotis, and long-legged myotis) have the potential to occasionally occur in trees and structures within the Study Area or around the periphery. Trees may provide suitable habitat for bats to find short-term refuge for the purposes of day or night roosting during the active season,

and therefore presence or absence cannot be determined until soon before construction activities, including tree removal and building demolition, will be initiated. Removal and trimming of any trees or building demolition during the bat maternity season (generally, April through August) could impact bat breeding and potentially result in an adverse impact to bats.

Potential Impact BIO-3: In addition to the special-status bird species discussed above (white-tailed kite), a variety of non-status bird species with baseline protections under the MBTA and CFGC may use vegetation within the Study Area for nesting and nesting birds could be adversely affected by construction activities. Vegetation on the proposed development site may provide birds an opportunity to nest. Ground-nesting birds may use even disturbed areas for nesting.

Potential Impact BIO-4: The portion of the Petaluma River within the Study Area has the potential to support several species of special-status fishes including green sturgeon, white sturgeon, steelhead, Sacramento splittail, river lamprey, and Pacific lamprey. Additionally, the Study Area is within designated critical habitat for green sturgeon and steelhead. The river also has common fish species that are not protected by the ESA or CESA, but can serve as prey species for special-status fish such as steelhead and Chinook salmon. Project work to upgrade the storm drain culverts has the potential to adversely impact these aquatic species as follows: (1) removing the existing culverts within the Petaluma River and McNear Channel has the potential to mobilize sediment and temporarily increase turbidity levels in areas where fish may be present; (2) fish could be impacted because of noise or vibration; (3) fish could get stranded behind barriers (such as coffer dams, etc.); (4) toxic pollutants, such as fuel or wet concrete could spill into the river; (5) there is the potential to transport invasive aquatic species into and out of the waterway.

To reduce potential impacts to a less-than-significant level, the following measures shall be implemented year-round:

Mitigation Measure BIO-2: Any tree and building removal shall be performed from September 1 through March 1, outside of the general bat maternity season. If tree or building removal during this period is not feasible, a bat roost survey shall be performed by a qualified biologist no more than 60 days prior to demo/removal to determine if bats are present in the trees or structures. During this survey, the qualified bat biologist shall determine if an active roost is present and if colonization by bats is likely. If bats are present, a bat exclusion plan shall be developed and implemented. If bats are absent, but potential for colonization is determined to be likely, the biologist shall make recommendations to prevent colonization. Within 14 days of commencement of construction, the biologist shall resurvey the structures and trees to determine if any bats are present. If no roosting bats are detected, then no further action is warranted. If bat maternity roosts are detected, then roost trees and structures shall be avoided until the end of the maternity roosting season. Irrespective of time of year, all felled trees and demolished buildings shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats present to escape. If more than 7 days lapse between the end of the survey and start of construction, the survey shall be repeated.

Mitigation Measure BIO-3: Vegetation removal (including trees) and initial ground disturbance shall occur from September 1 to January 31 which is outside of the general bird nesting season. If tree/vegetation removal during this time is not feasible, a pre-construction nesting bird survey

shall be performed by a qualified biologist no more than 7 days prior to the initiation of tree removal or ground disturbance, paying special attention to areas of more dense vegetation cover. The survey shall include the Project Area and surrounding areas within 500 feet. If active bird nests are found during the survey, an appropriate no-disturbance buffer specific to the bird species shall be established by the qualified biologist. Once it is determined that the young have fledged (left the nest) or the nest otherwise becomes inactive (e.g., due to predation), the buffer restriction shall be removed and work may be initiated within the buffer. If more than 7 days lapse between the end of the survey and start of construction, the survey shall be repeated.

Mitigation Measure BIO-4: Prior to installation of the outfall culvert upgrade work, the appropriate permits for the work from regulatory agencies shall be obtained. The permit authorization process shall include, if needed and at the discretion of the regulatory agencies involved, consultation with National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and/or California Department of Fish and Wildlife (CDFW) to determine if avoidance, minimization, and mitigation measures beyond those described below are necessary. At a minimum, the following measures shall be implemented.

General avoidance and minimization measures that will be implemented during the Project are outlined below and shall include but not be limited to:

- An environmental awareness training program will be given to all crew members working on the outfall replacement part of the Project. The training will be given by a qualified biologist and shall include education on sensitive resources such as protected fish and wildlife with the potential to occur within the Study Area, water quality, and environmental protection measures.
- Equipment will be cleaned prior to being moved onsite and prior to being removed such that it will not pose a potential to introduce or spread invasive plant or animal species.
- Erosion control measures will be utilized throughout all phases of the Project where sediment runoff from construction may potentially enter waters. Erosion control structures will be monitored for effectiveness and will be repaired or replaced as needed. Appropriate erosion control measures will be installed around any stockpiles of soil or other materials which could be mobilized by rainfall or runoff. Erosion control structures shall not include plastic monofilament or other components that may entrap wildlife.
- Prior to construction, an Accidental Spill Prevention and Cleanup Plan shall be prepared. This plan shall include required spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times.
- No fueling, cleaning, or maintenance of vehicles or equipment will take place within any areas where an accidental discharge may cause hazardous materials to enter waterways.
- Any equipment or vehicles used for the Project will be checked and maintained daily to prevent leaks of fluids that could be deleterious to aquatic habitats.
- All equipment will be cleaned before arriving on the site and before removal from the site to prevent spread of invasive plants.
- Construction disturbance or removal of vegetation will be restricted to the minimum footprint necessary to complete the work. The work area will be delineated where necessary to minimize impacts to vegetated habitats beyond the work limit, or to protected vegetation within the work area.
- Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the stream channel banks and outside of seasonal wetlands.
- Stationary equipment such as motors, pumps, and generators, located adjacent to aquatic features will be positioned over secondary containment sufficient to arrest a catastrophic failure.

- All activities performed near aquatic features will have absorbent materials designated for spill containment and cleanup activities on-site for use in an accidental spill.
- Stockpiles of excavated soil or other will be covered when not in active use (i.e. will not be used, or moved for 72 hours). All trucks hauling soil, sand, and other loose materials will be covered.
- No construction debris of any type will be allowed to enter or be placed where they may be washed into any aquatic features.
- At the end of the project all temporary flagging, fencing, or other materials will be removed from the project site and vicinity of the channel.
- No equipment shall be washed down where runoff could enter the creek.
- No motorized equipment shall be left within the channel overnight.
- All refueling and maintenance of equipment, other than stationary equipment, shall occur outside of the top-of-bank. Refueling of stationary equipment within the channel (top of bank to top of bank) shall only occur when secondary containment sufficient to eliminate escape of all potential fluids is in place.

Avoidance and Minimization Measures for NMFS Species and resources (including critical habitat and essential fish habitat) that shall be implemented during the proposed Project are outlined below.

- Any work below the top of bank shall be completed during the dry season, between June 15 and October 15.
- No work requiring heavy machinery to enter the wetted channel of the Petaluma River will be conducted. To the greatest extent feasible, any work below the top of bank of the Petaluma River will be conducted using an excavator or other similar equipment capable of reaching the work area from above top of bank.
- Work will be conducted during the lowest tidal periods of the day to minimize disturbance to aquatic habitat and preclude need for using a coffer dam.
- Prior to beginning work below the high tide line, a qualified biologist will place exclusion nets to prevent fish from temporarily occupying waters that may be accidentally impacted by landslides or similar failures. The exclusion nets shall be of sufficient height to span the water column and small enough in size (1/8 inch or less) to exclude juvenile fish from areas that may be subject to disturbance during excavation.
- To prevent the spread of turbidity that might be caused by liberation of sediment, a turbidity curtain shall be installed within the exclusion zone created by block nets whenever equipment makes contact with substrate below the high tide line and when rip-rap is installed.
- Native vegetation removed shall be limited to the minimum necessary in order to complete outfall culvert installation and shall be replanted within the work area where appropriate. For mitigation of loss of wetland habitat, see MM Bio 5.

If the mitigation measures described above are followed, potential impacts will be reduced to a ***less than significant level***.

7.2 Sensitive Natural Communities and Land Cover Types

This section addresses the question:

Does the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

The majority of the Study Area is comprised of developed/disturbed lands and ruderal herbaceous grassland (see Representative Photographs, Appendix D). These land types are not considered sensitive habitats and have low biological resource value due to their highly disturbed condition and surrounding urban development including streets, warehouses, and office buildings. Sensitive natural communities present within the Study Area include: tidal waters (Petaluma River and McNear Channel), and associated coastal salt marsh fringe. Both of these are sensitive aquatic resources which are considered Waters of the U.S. and State. Potential impacts and mitigation measures are discussed in Section 7.3 below.

7.3 Aquatic Resources

This section analyzes the Project's potential impacts and mitigation for wetlands and other areas presumed or determined to be within the jurisdiction of the Corps in reference to the significance threshold outlined in CEQA Appendix G, Part IV I:

Does the Project have the potential to have a substantial adverse effect on state or federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The Study area contains tidal waters (Petaluma River and McNear Channel) and associated coastal salt marsh fringe. Both of these are sensitive aquatic resources which are considered Waters of the U.S. and State. The majority of these areas will not incur direct impacts associated with the Project. However, approximately 0.003 acre (149 square feet) of the coastal tidal marsh fringe, and 0.001 acre (22 square feet) of tidal waters below HTL will likely be impacted via culvert outfall and rip rap footing construction,. The following mitigation measures are provided to avoid or otherwise minimize potential impacts to these sensitive aquatic resources.

Potential Impact BIO-5: The Study Area contains 0.581 acres of coastal salt marsh fringe within banks of the Petaluma River. The replacement upgrade of the existing outfall culverts to a larger size is proposed which could result in fill in jurisdictional coastal salt marsh fringe wetland.

Potential Impact BIO-6: Sediment runoff into the Petaluma River or McNear Channel could adversely affect water quality and grading activities or upsizing the outfall culvert at the river have potential for sediment runoff into the Petaluma River.

To reduce potential impacts to a less-than-significant level, the following measures shall be implemented year-round:

Mitigation Measure BIO-5: Temporary or permanent impacts to coastal salt marsh fringe wetland related to outfall replacement upgrade shall be authorized by obtaining permits from appropriate regulatory agencies. Permits which may be necessary include a Section 10 Rivers and Harbors Act and/or a Section 404 CWA permit from the Corps, a Section 401 Water Quality Certification from RWQCB, and a 1602 Lake and Streambed Alteration Agreement (LSAA) from CDFW. As part of the Corps/RWQCB permit application packages, demonstrate mitigation measures to off-set losses to tidal wetlands replaced at a minimum 1:1 ratio on a functions and values basis. Mitigation may be by purchase of created wetlands credits from an approved mitigation bank or proponent created wetlands at an offsite location. The appropriate permits shall be obtained from regulatory agencies prior to initial grading/construction which shall include approval of a wetlands mitigation plan.

Mitigation Measure BIO-6: To reduce erosion in the river during project activities, the following measures shall be implemented in addition to any additional measures that may be incorporated into regulatory agency permits.

Water quality in the Petaluma River shall be protected from sediment or other pollutants by developing a storm water pollution prevention plan to be implemented during construction and post-construction. Appropriate best management practices (BMPs) shall be developed and implemented before, during, and post construction, including the following:

- Project work shall be conducted, as much as practicable, during the dry season (May through October) to reduce runoff into the river. If rainfall is in the forecast predicted to be greater than one-half inch over a 24-hour period, standard erosion control measures (e.g., straw wattles, bales, silt fencing) shall be deployed and grading shall be suspended.
- Silt wattles shall be installed along the river bank within the Study Area, outside of active ground disturbance. Following completion of ground disturbance, silt wattles shall be installed along the stream bank, above the mean high water. Silt wattles shall be made of jute and not plastic.
- All equipment shall be staged above the top of bank and spill kits shall be located within working equipment. Equipment fuels and lubricants shall be prevented from reaching the river by locating fueling/maintenance areas an appropriate distance away from the river or drainage ways to the river and construction contractors shall have a spill prevention kit and plan on location.
- Uncured concrete shall not be exposed to water flowing to the river or within the river itself and all excess uncured concrete shall be properly disposed of at an offsite location.

Areas of vegetation removal shall be limited to the smallest area feasible. Any areas of bare ground shall be re-seeded immediately following completion of all ground disturbance work. Additional erosion control measures (jute, hay) as feasible will be installed prior to rainy season. Areas of exposed stream bank above the mean high water shall be planted with native species appropriate for area and habitat.

7.4 Wildlife Corridors and Native Wildlife Nursery Sites

This section analyzes the Project's potential impacts and mitigation for habitat corridors and linkages in reference to the significance threshold outlined in CEQA Appendix G, Part IV (d):

Does the Project have the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

As noted in Section 5.3, no portions of the Study Area provide connectivity between areas of suitable habitat. For terrestrial species, all portions of the Study Area are within a greater context of urban development, and for aquatic species, there is no connectivity between the Study Area and upstream freshwater habitats. No impact will occur to migratory corridors for terrestrial and aquatic species.

7.5 Local Policies and Ordinances

This section analyzes the Project's potential impacts and mitigation based on conflicts with local policies and ordinances in reference to the significance threshold outlined in CEQA Appendix G, Part I(e):

Does the Project have the potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Local plans and policies related to biological resources examined in this analysis include the City of Petaluma Tree Ordinance.

Potential Impact BIO-7: A limited amount of tree removal may be required for the Project, as needed for construction, access, and redevelopment of the site. Some of the trees to be removed or otherwise impacted may be classified as protected trees per the City of Petaluma Tree Ordinance which protects certain native tree species and trees in the public right-of-way or otherwise protected by local ordinances. (Potential conflicts with local policies and ordinances along with measures to avoid and mitigate these conflicts are discussed below.

To reduce potential impacts to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-7: A comprehensive tree survey of the Study Area shall be conducted by an ISA-Certified Arborist to identify the presence and condition of protected and non-protected trees within the Project Area which could be impacted by the development. Following the arborist survey, a report shall be prepared which identifies tree removal impacts and which trees if any will require a tree removal permit from the City of Petaluma. A tree removal permit shall be obtained for the removal of any protected tree, and the project shall follow all conditions of approval of the tree permit.

8.0 REFERENCES

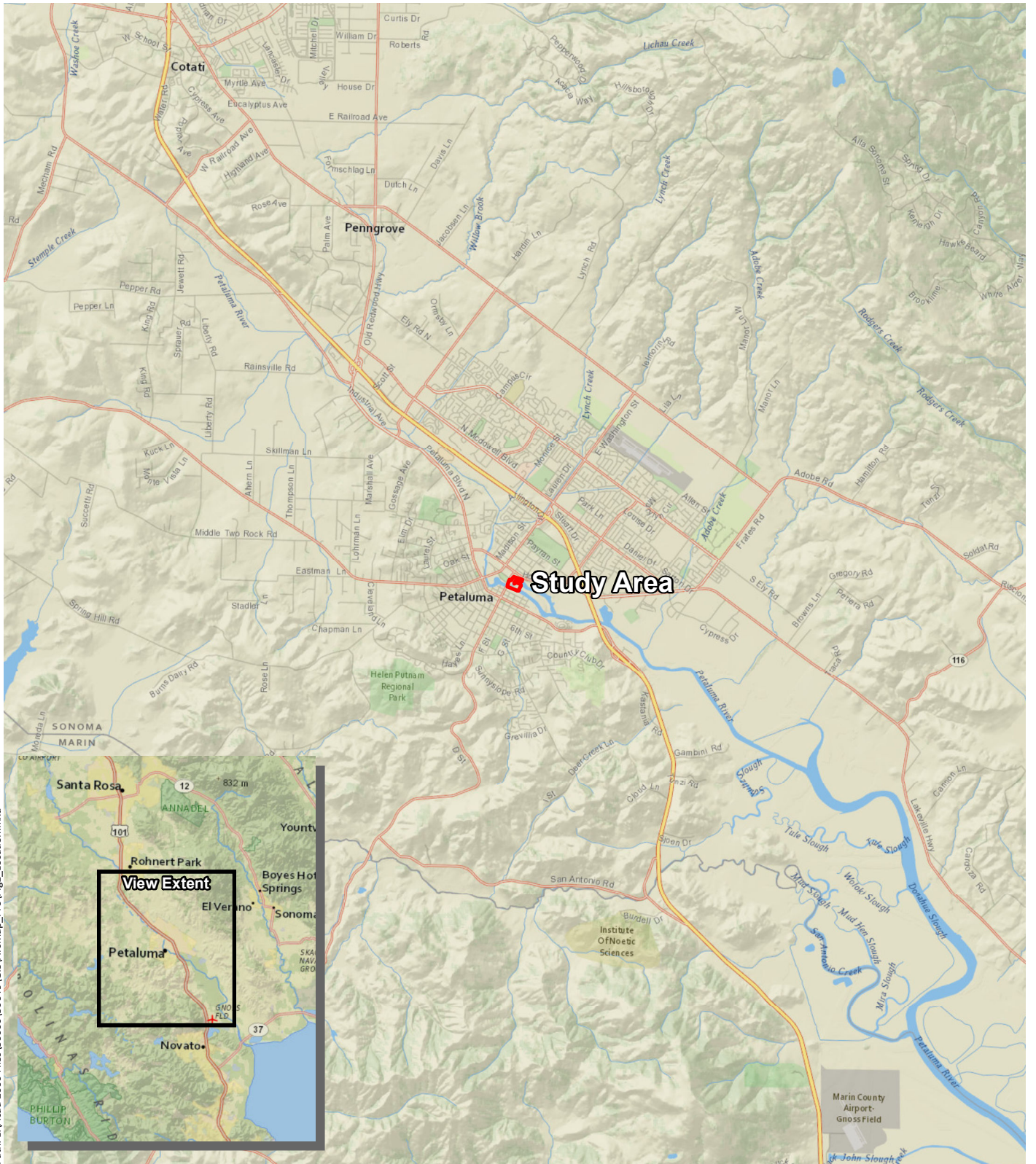
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Appendix A – Figures

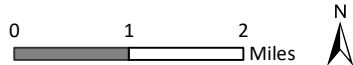
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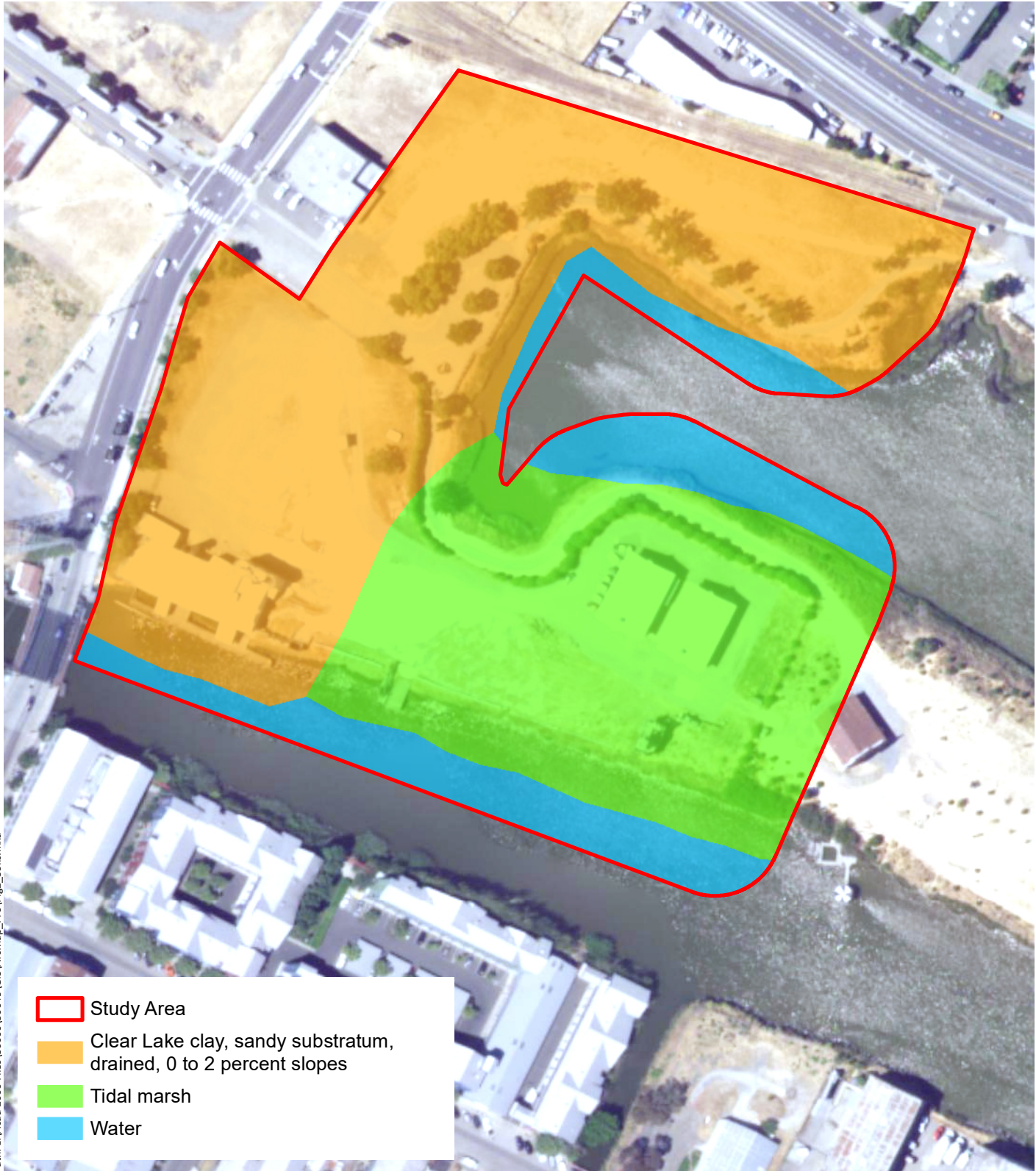


Sources: National Geographic, WRA | Prepared By: SGillespie, 2/17/2022

Figure 1. Study Area Regional Location Map

Oyster Cove
Petaluma, California

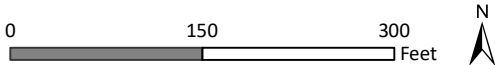




Sources: 2020 NAIP Aerial, WRA | Prepared By: SGillespie, 3/24/2022

Figure 2. Soils Map

Oyster Cove
Petaluma, California

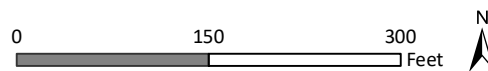




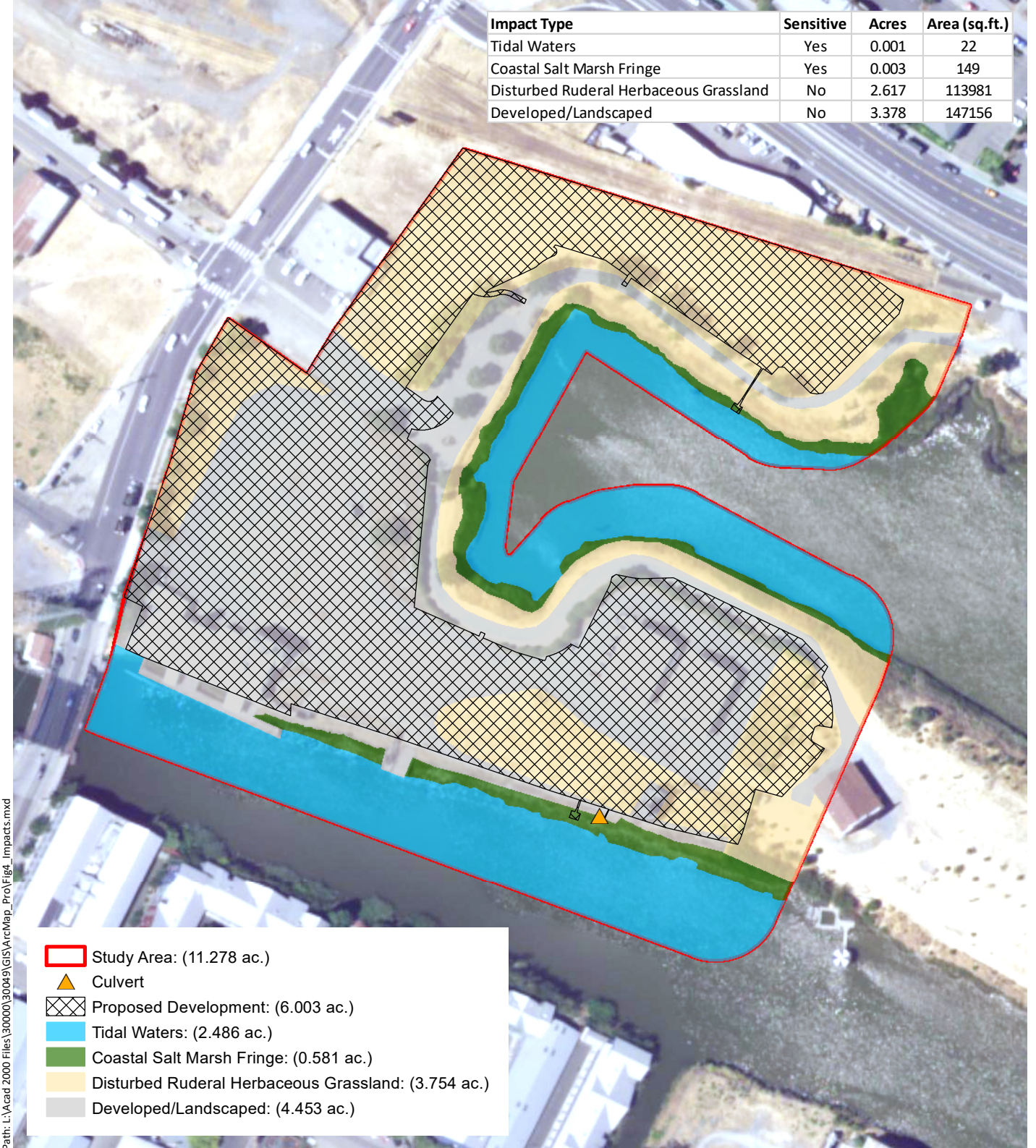
Sources: 2020 NAIP Aerial, WRA | Prepared By: SGillespie, 3/23/2022

Figure 3. Land Cover Types

Oyster Cove
Petaluma, California



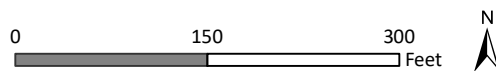
Impact Type	Sensitive	Acres	Area (sq.ft.)
Tidal Waters	Yes	0.001	22
Coastal Salt Marsh Fringe	Yes	0.003	149
Disturbed Ruderal Herbaceous Grassland	No	2.617	113981
Developed/Landscaped	No	3.378	147156



Sources: 2020 NAIP Aerial, WRA | Prepared By: SGillespie, 3/23/2022

Figure 4. Proposed Impacts

Oyster Cove
Petaluma, California



Appendix B – Wildlife and plant species observed in Study Area, January 11 and 21, 2022.

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Appendix B – Wildlife and plant species observed in Study Area, January 11 and 21, 2022.

SCIENTIFIC NAME	COMMON NAME	ORIGIN	FORM	RARITY STATUS ¹	CAL-IPC STATUS ²	WETLAND STATUS ³ (AW 2016)
Plants						
<i>Avena barbata</i>	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
<i>Baccharis pilularis</i>	Coyote brush	native	shrub	-	-	-
<i>Brassica nigra</i>	Black mustard	non-native (invasive)	annual herb	-	Moderate	-
<i>Bromus diandrus</i>	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
<i>Bromus hordeaceus</i>	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU
<i>Calendula officinalis</i>	Pot marigold	non-native	annual herb	-	-	-
<i>Carduus pycnocephalus</i> <i>ssp. pycnocephalus</i>	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-
<i>Cirsium occidentale</i>	Western thistle	native	perennial herb	-	-	-
<i>Conium maculatum</i>	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate	FACW
<i>Cotula coronopifolia</i>	Brass buttons	non-native (invasive)	perennial herb	-	Limited	OBL
<i>Distichlis spicata</i>	Salt grass	native	perennial grass	-	-	FAC
<i>Dittrichia graveolens</i>	Stinkwort	non-native (invasive)	annual herb	-	Moderate	-
<i>Epilobium brachycarpum</i>	Willow herb	native	annual herb	-	-	FAC
<i>Erodium cicutarium</i>	Red stemmed filaree	non-native (invasive)	annual herb	-	Limited	-
<i>Erodium moschatum</i>	White stem filaree	non-native	annual herb	-	-	-

SCIENTIFIC NAME	COMMON NAME	ORIGIN	FORM	RARITY STATUS ¹	CAL-IPC STATUS ²	WETLAND STATUS ³ (AW 2016)
<i>Eschscholzia californica</i>	California poppy	native	annual, perennial herb	-	-	-
<i>Festuca brachyphylla ssp. breviculmis</i>	Short leaved fescue	native	perennial grass	-	-	-
<i>Foeniculum vulgare</i>	Fennel	non-native (invasive)	perennial herb	-	High	-
<i>Fraxinus sp.</i>	Ash	-	-	-	-	-
<i>Galium aparine</i>	Cleavers	native	annual herb	-	-	FACU
<i>Geranium dissectum</i>	Wild geranium	non-native (invasive)	annual herb	-	Limited	-
<i>Geranium molle</i>	Crane's bill geranium	non-native	annual, perennial herb	-	-	-
<i>Grindelia stricta</i>	Gumweed	native	perennial herb	-	-	FACW
<i>Helminthotheca echioides</i>	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC
<i>Hirschfeldia incana</i>	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
<i>Hordeum murinum</i>	Foxtail barley	non-native (invasive)	annual grass	-	Moderate	FACU
<i>Hypochaeris radicata</i>	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
<i>Juglans hindsii</i>	Northern California black walnut	native	tree	-	-	FAC
<i>Jaumea carnosa</i>	Marsh jaumea	native	perennial herb	-	-	OBL
<i>Malacothrix sonchoides</i>	Sow thistle malacothrix	native	annual herb	-	-	-
<i>Malva parviflora</i>	Cheeseweed	non-native	annual herb	-	-	-
<i>Medicago polymorpha</i>	Bur clover	non-native (invasive)	annual herb	-	Limited	FACU
<i>Nasturtium officinale</i>	Watercress	native	perennial herb (aquatic)	-	-	OBL

SCIENTIFIC NAME	COMMON NAME	ORIGIN	FORM	RARITY STATUS ¹	CAL-IPC STATUS ²	WETLAND STATUS ³ (AW 2016)
<i>Oxalis pes-caprae</i>	Bermuda buttercup	non-native (invasive)	perennial herb	-	Moderate	-
<i>Phalaris aquatica</i>	Harding grass	non-native (invasive)	perennial grass	-	Moderate	FACU
<i>Plantago lanceolata</i>	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC
<i>Platanus xhispanica</i>	London plane tree	non-native	tree	-	-	-
<i>Poa annua</i>	Annual blue grass	non-native	annual grass	-	-	FAC
<i>Polygonum aviculare</i>	Prostrate knotweed	non-native	annual, perennial herb	-	-	FAC
<i>Populus fremontii ssp. fremontii</i>	Cottonwood	native	tree	-	-	FAC
<i>Quercus agrifolia</i>	Coast live oak	native	tree	-	-	-
<i>Quercus lobata</i>	Valley oak	native	tree	-	-	FACU
<i>Quercus suber</i>	Cork oak	non-native	tree	-	-	-
<i>Raphanus sativus</i>	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-
<i>Rosa sp.</i>	Rose	-	-	-	-	-
<i>Rubus armeniacus</i>	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
<i>Rubus ursinus</i>	California blackberry	native	vine, shrub	-	-	FAC
<i>Salicornia pacifica</i>	Pickleweed	native	perennial herb	-	-	OBL
<i>Salix babylonica</i>	Weeping willow	non-native	tree	-	-	FAC
<i>Salix laevigata</i>	Red willow	native	tree	-	-	FACW
<i>Senecio vulgaris</i>	Common groundsel	non-native	annual herb	-	-	FACU
<i>Silybum marianum</i>	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-
<i>Soliva sessilis</i>	South American soliva	non-native	annual herb	-	-	FACU
<i>Sonchus oleraceus</i>	Common sow thistle	non-native	annual herb	-	-	UPL

SCIENTIFIC NAME	COMMON NAME	ORIGIN	FORM	RARITY STATUS ¹	CAL-IPC STATUS ²	WETLAND STATUS ³ (AW 2016)
<i>Spartina sp.</i>	Cord grass	-	-	-	-	-
<i>Taraxacum officinale</i>	Red seeded dandelion	non-native	perennial herb	-	-	FACU
<i>Vicia sativa</i>	Spring vetch	non-native	annual herb, vine	-	-	FACU
<i>Vicia villosa</i>	Hairy vetch	non-native	annual herb, vine	-	-	-

All species identified using the *Jepson Manual, 2nd Edition* (Baldwin et al. 2012) and *A Flora of Sonoma County* (Best et al. 1996); nomenclature follows *The Jepson Flora Project* (eFlora 2020) unless otherwise noted. Sp.: “species”, intended to indicate that the observer was confident in the identity of the genus but uncertain which species

Cf.: intended to indicate a species appeared to the observer to be specific, but was not identified based on diagnostic characters

¹Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2020)

- FE: Federal Endangered
- FT: Federal Threatened
- SE: State Endangered
- ST: State Threatened
- SR: State Rare
- Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
- Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
- Rank 2A: Plants presumed extirpated in California, but more common elsewhere
- Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
- Rank 3: Plants about which we need more information – a review list
- Rank 4: Plants of limited distribution – a watch list

²Invasive Status: California Invasive Plant Inventory (Cal-IPC 2020)

- High: Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
- Moderate: Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited- moderate distribution ecologically
- Limited: Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
- Assessed: Assessed by Cal-IPC and determined to not be an existing current threat

³Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

- OBL: Almost always a hydrophyte, rarely in uplands
- FACW: Usually a hydrophyte, but occasionally found in uplands
- FAC: Commonly either a hydrophyte or non-hydrophyte
- FACU: Occasionally a hydrophyte, but usually found in uplands
- UPL: Rarely a hydrophyte, almost always in uplands
- NL: Rarely a hydrophyte, almost always in uplands
- NI: No information; not factored during wetland delineation

Appendix B cont. Wildlife species observed in and around the Study Area on January 21, 2022

Scientific Name	Common Name
Birds	
<i>Aphelocoma californica</i>	Scrub jay
<i>Butorides virescens</i>	Green heron
<i>Calypte anna</i>	Anna's hummingbird
<i>Columbia livia</i>	Rock pigeon
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven
<i>Larus sp.</i>	Gull sp.
<i>Melospiza melodia</i>	Heermann's Song sparrow
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Phalacrocorax auritus</i>	Double crested cormorant
<i>Sturnus vulgaris</i>	European starling
<i>Zonotrichia atricapilla</i>	Golden-crowned sparrow
<i>Zonotrichia leucophrys</i>	White-crowned sparrow

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Appendix C – Special-status Species Potential Table

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SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN THE STUDY AREA	RESULTS AND RECOMMENDATIONS
PLANTS				
pink sand-verbena <i>Abronia umbellata</i> var. <i>breviflora</i>	Rank 1B.1	coastal dunes. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	No Potential. The Study Area does not contain sand dunes.	No further recommendations for this species.
Blasdale's bent grass <i>Agrostis blasdalei</i>	Rank 1B.2	coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms May-Jul.	No Potential. The Study Area is not located very near the coast nor contains coastal habitats.	No further recommendations for this species.
Franciscan onion <i>Allium peninsulare</i> var. <i>franciscanum</i>	Rank 1B.2	cismontane woodland, valley and foothill grassland. Elevation ranges from 170 to 1000 feet (52 to 305 meters). Blooms (Apr)May-Jun.	Unlikely. The Study Area is highly disturbed and does not contain serpentine soils.	No further recommendations for this species.
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE, Rank 1B.1	marshes and swamps, riparian scrub. Elevation ranges from 15 to 1200 feet (5 to 365 meters). Blooms May-Jul.	No Potential. The Study Area is highly disturbed and does not contain perennial aquatic features.	No further recommendations for this species.
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	Rank 1B.2	broadleafed upland forest, chaparral, cismontane woodland. Elevation ranges from 165 to 6560 feet (50 to 2000 meters). Blooms Apr-Jul.	No Potential. The Study Area is highly disturbed and does not contain forest, woodland or chaparral habitat.	No further recommendations for this species.
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	Rank 1B.2	cismontane woodland, coastal bluff scrub, valley and foothill grassland. Elevation ranges from 10 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	Unlikely. The Study Area is highly disturbed and does not contain woodland or scrub habitats.	No further recommendations for this species.
coast rockcress <i>Arabis blepharophylla</i>	Rank 4.3	broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges	No Potential. The Study Area is highly disturbed and does not contain rocky outcrops.	No further recommendations for this species.

		from 10 to 3610 feet (3 to 1100 meters). Blooms Feb-May.		
Mt. Tamalpais manzanita <i>Arctostaphylos montana ssp. montana</i>	Rank 1B.3	chaparral, valley and foothill grassland. Elevation ranges from 525 to 2495 feet (160 to 760 meters). Blooms Feb-Apr.	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat nor serpentine soils.	No further recommendations for this species.
Marin manzanita <i>Arctostaphylos virgata</i>	Rank 1B.2	broadleafed upland forest, chaparral, closed-cone coniferous forest, north coast coniferous forest. Elevation ranges from 195 to 2295 feet (60 to 700 meters). Blooms Jan-Mar.	No Potential. The Study Area is highly disturbed and does not contain forest or chaparral habitat.	No further recommendations for this species.
coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	Rank 1B.2	coastal dunes, coastal scrub, marshes and swamps. Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms (Apr)Jun-Oct.	No Potential. The Study Area is highly disturbed and does not contain mesic sites in dunes or salt marsh.	No further recommendations for this species.
alkali milk-vetch <i>Astragalus tener var. tener</i>	Rank 1B.2	playas, valley and foothill grassland, vernal pools. Elevation ranges from 5 to 195 feet (1 to 60 meters). Blooms Mar-Jun.	Unlikely. The Study Area is highly disturbed and does not contain playas nor vernal pools.	No further recommendations for this species.
Sonoma sunshine <i>Blennosperma bakeri</i>	FE, SE, Rank 1B.1	valley and foothill grassland, vernal pools. Elevation ranges from 35 to 360 feet (10 to 110 meters). Blooms Mar-May.	Unlikely. The Study Area is highly disturbed and does not contain vernal pools.	No further recommendations for this species.
narrow-anthered brodiaea <i>Brodiaea leptandra</i>	Rank 1B.2	broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 360 to 3000 feet (110 to 915 meters). Blooms May-Jul.	No Potential. The Project Area does not contain habitat types associated with this species and it is below the elevational range of the species.	No further recommendations for this species.
Bolander's reed grass <i>Calamagrostis bolanderi</i>	Rank 4.2	bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub,	Unlikely. The Study Area is highly disturbed and does not	No further recommendations for this species.

		marshes and swamps, meadows and seeps, north coast coniferous forest. Elevation ranges from 0 to 1495 feet (0 to 455 meters). Blooms May-Aug.	contain perennial aquatic features nor forest habitat.	
serpentine reed grass <i>Calamagrostis ophitidis</i>	Rank 4.3	chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	No Potential. Although the Study Area contains ruderal herbaceous grassland, the site is partially developed, surrounded on all sides by urban development, has been repeatedly and routinely disturbed by mowing and/or discing, and is characteristically lacking in native herbaceous species diversity, making presence of special-status plant species unlikely	No further recommendations for this species.
Oakland star-tulip <i>Calochortus umbellatus</i>	Rank 4.2	broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 330 to 2295 feet (100 to 700 meters). Blooms Mar-May.	Unlikely. The Study Area is highly disturbed and does not contain forest habitat nor serpentine soils.	No further recommendations for this species.
swamp harebell <i>Campanula californica</i>	Rank 1B.2	bogs and fens, closed-cone coniferous forest, coastal prairie, marshes and swamps, meadows and seeps, north coast coniferous forest. Elevation ranges from 5 to 1330 feet (1 to 405 meters). Blooms Jun-Oct.	No Potential. The Study Area is highly disturbed and does not contain perennial aquatic features nor forest habitat.	No further recommendations for this species.

seaside bittercress <i>Cardamine angulata</i>	Rank 2B.2	lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 50 to 3000 feet (15 to 915 meters). Blooms (Jan)Mar-Jul.	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
Lyngbye's sedge <i>Carex lyngbyei</i>	Rank 2B.2	marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Aug.	No Potential. The Study Area is highly disturbed and does not contain perennial aquatic features.	No further recommendations for this species.
Tiburon paintbrush <i>Castilleja affinis var. neglecta</i>	FE, ST, Rank 1B.2	valley and foothill grassland. Elevation ranges from 195 to 1310 feet (60 to 400 meters). Blooms Apr-Jun.	No Potential. The Study Area is highly disturbed and does not contain rocky serpentine outcrops.	No further recommendations for this species.
johnny-nip <i>Castilleja ambigua var. ambigua</i>	Rank 4.2	coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	Unlikely. The Study Area is highly disturbed and does not contain vernal pools and is not located very near the coast.	No further recommendations for this species.
Humboldt Bay owl's-clover <i>Castilleja ambigua var. humboldtiensis</i>	Rank 1B.2	marshes and swamps. Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms Apr-Aug.	No Potential. The Study Area is highly disturbed and does not contain salt marsh.	No further recommendations for this species.
Nicasio ceanothus <i>Ceanothus decornutus</i>	Rank 1B.2	chaparral. Elevation ranges from 770 to 950 feet (235 to 290 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat.	No further recommendations for this species.
glory brush <i>Ceanothus gloriosus var. exaltatus</i>	Rank 4.3	chaparral. Elevation ranges from 100 to 2000 feet (30 to 610 meters). Blooms Mar-Jun(Aug).	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat.	No further recommendations for this species.
Point Reyes ceanothus <i>Ceanothus gloriosus var. gloriosus</i>	Rank 4.3	closed-cone coniferous forest, coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and is not located very near the coast nor contains forest habitat.	No further recommendations for this species.

Mt. Vision ceanothus <i>Ceanothus gloriosus</i> var. <i>porrectus</i>	Rank 1B.3	closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 80 to 1000 feet (25 to 305 meters). Blooms Feb-May.	No Potential. The Study Area is highly disturbed and does not contain forest habitat nor is located very near the coast.	No further recommendations for this species.
Mason's ceanothus <i>Ceanothus masonii</i>	SR, Rank 1B.2	chaparral. Elevation ranges from 755 to 1640 feet (230 to 500 meters). Blooms Mar-Apr.	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat.	No further recommendations for this species.
Sonoma ceanothus <i>Ceanothus sonomensis</i>	Rank 1B.2	chaparral. Elevation ranges from 705 to 2625 feet (215 to 800 meters). Blooms Feb-Apr.	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat.	No further recommendations for this species.
pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	Rank 1B.2	chaparral, coastal prairie, marshes and swamps, meadows and seeps, valley and foothill grassland. Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	Moderate Potential. While the Study Area is highly disturbed, this species can occur in such disturbed areas in non-native grasslands.	A protocol-level special-status plant survey should be conducted in July to determine presence.
Point Reyes salty bird's-beak <i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Rank 1B.2	marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	Unlikely. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
soft salty bird's-beak <i>Chloropyron molle</i> ssp. <i>molle</i>	FE, SR, Rank 1B.2	marshes and swamps. Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms Jun-Nov.	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed,	No further recommendations for this species.

			providing only marginal habitat for special-status plants.	
Sonoma spineflower <i>Chorizanthe valida</i>	FE, SE, Rank 1B.1	coastal prairie. Elevation ranges from 35 to 1000 feet (10 to 305 meters). Blooms Jun-Aug.	No Potential. The Study Area is highly disturbed and does not contain coastal prairie habitat nor is located very near the coast.	No further recommendations for this species.
Bolander's water-hemlock <i>Cicuta maculata var. bolanderi</i>	Rank 2B.1	marshes and swamps. Elevation ranges from 0 to 655 feet (0 to 200 meters). Blooms Jul-Sep.	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
Franciscan thistle <i>Cirsium andrewsii</i>	Rank 1B.2	broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	No Potential. The Study Area is highly disturbed and does not contain scrub or forest habitat.	No further recommendations for this species.
Mt. Tamalpais thistle <i>Cirsium hydrophilum var. vaseyi</i>	Rank 1B.2	broadleafed upland forest, chaparral, meadows and seeps. Elevation ranges from 785 to 2035 feet (240 to 620 meters). Blooms May-Aug.	No Potential. The Study Area is highly disturbed and does not contain serpentine seeps or streams.	No further recommendations for this species.
Baker's larkspur <i>Delphinium bakeri</i>	FE, SE, Rank 1B.1	broadleafed upland forest, coastal scrub, valley and foothill grassland. Elevation ranges from 260 to 1000 feet (80 to 305 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
golden larkspur <i>Delphinium luteum</i>	FE, SR, Rank 1B.1	chaparral, coastal prairie, coastal scrub. Elevation ranges from 0 to	No Potential. The Study Area is highly disturbed and does	No further recommendations for this species.

		330 feet (0 to 100 meters). Blooms Mar-May.	not contain chaparral or other scrub habitat.	
western leatherwood <i>Dirca occidentalis</i>	Rank 1B.2	broadleafed upland forest, chaparral, cismontane woodland, closed-cone coniferous forest, north coast coniferous forest, riparian forest, riparian woodland. Elevation ranges from 80 to 1395 feet (25 to 425 meters). Blooms Jan-Mar (Apr).	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
dwarf downingia <i>Downingia pusilla</i>	Rank 2B.2	valley and foothill grassland, vernal pools. Elevation ranges from 5 to 1460 feet (1 to 445 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and does not contain vernal pools.	No further recommendations for this species.
small spikerush <i>Eleocharis parvula</i>	Rank 4.3	marshes and swamps. Elevation ranges from 5 to 9910 feet (1 to 3020 meters). Blooms (Apr) Jun-Aug (Sep).	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
California bottle-brush grass <i>Elymus californicus</i>	Rank 4.3	broadleafed upland forest, cismontane woodland, north coast coniferous forest, riparian woodland. Elevation ranges from 50 to 1540 feet (15 to 470 meters). Blooms May-Aug(Nov).	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
Koch's cord moss <i>Entosthodon kochii</i>	Rank 1B.3	cismontane woodland. Elevation ranges from 590 to 3280 feet (180 to 1000 meters).	No Potential. The Study Area is highly disturbed and does not contain woodland habitat.	No further recommendations for this species.

streamside daisy <i>Erigeron biolettii</i>	Rank 3	broadleafed upland forest, cismontane woodland, north coast coniferous forest. Elevation ranges from 100 to 3610 feet (30 to 1100 meters). Blooms Jun-Oct.	No Potential. The Study Area is highly disturbed and does not contain forest habitat nor rocky outcrops.	No further recommendations for this species.
Tiburon buckwheat <i>Eriogonum luteolum var. caninum</i>	Rank 1B.2	chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms May-Sep.	No Potential. The Study Area is highly disturbed and does not contain serpentine soils.	No further recommendations for this species.
bluff wallflower <i>Erysimum concinnum</i>	Rank 1B.2	coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 0 to 605 feet (0 to 185 meters). Blooms Feb-Jul.	No Potential. The Study Area is highly disturbed and is not located very near the coast.	No further recommendations for this species.
Marin checker lily <i>Fritillaria lanceolata var. tristulis</i>	Rank 1B.1	coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 50 to 490 feet (15 to 150 meters). Blooms Feb-May.	No Potential. The Study Area is highly disturbed and does not contain topographic features which may support this species.	No further recommendations for this species.
fragrant fritillary <i>Fritillaria liliacea</i>	Rank 1B.2	cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 10 to 1345 feet (3 to 410 meters). Blooms Feb-Apr.	Unlikely. The Study Area is highly disturbed and does not contain serpentine soils nor woodland habitat.	No further recommendations for this species.
blue coast gilia <i>Gilia capitata ssp. chamissonis</i>	Rank 1B.1	coastal dunes, coastal scrub. Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Apr-Jul.	No Potential. The Study Area is highly disturbed and does not contain duen or coastal scrub habitat.	No further recommendations for this species.
woolly-headed gilia <i>Gilia capitata ssp. tomentosa</i>	Rank 1B.1	coastal bluff scrub, valley and foothill grassland. Elevation ranges from 35 to 720 feet (10 to 220 meters). Blooms May-Jul.	No Potential. The Study Area is highly disturbed and does not contain rocky outcrops nor serpentine soils.	No further recommendations for this species.

San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	Rank 3.2	coastal bluff scrub, coastal scrub, valley and foothill grassland (serpentine). Elevation ranges from 50 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	No Potential. The Study Area is highly disturbed, lacks serpentine substrate, and is not located very near the coast.	No further recommendations for this species.
white hayfield hayfield tarplant <i>Hemizonia congesta</i> ssp. <i>congesta</i>	Rank 1B.2	valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	Unlikely. The Study Area is highly disturbed, and there are no documented occurrences within 5 miles, rendering the presence of this species unlikely.	No further recommendations for this species.
Marin western flax <i>Hesperolinon congestum</i>	FT, ST, Rank 1B.1	chaparral, valley and foothill grassland. Elevation ranges from 15 to 1215 feet (5 to 370 meters). Blooms Apr-Jul.	No Potential. The Study Area is highly disturbed and does not contain serpentine soils.	No further recommendations for this species.
water star-grass <i>Heteranthera dubia</i>	Rank 2B.2	marshes and swamps. Elevation ranges from 100 to 4905 feet (30 to 1495 meters). Blooms Jul-Oct.	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
Point Reyes horkelia <i>Horkelia marinensis</i>	Rank 1B.2	coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 15 to 2475 feet (5 to 755 meters). Blooms May-Sep.	No Potential. The Study Area is highly disturbed and is not located very near the coast.	No further recommendations for this species.
harlequin lotus <i>Hosackia gracilis</i>	Rank 4.2	broad-leaved upland forest, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, meadows and seeps, north coast	Unlikely. The Study Area is highly disturbed and does not contain perennial aquatic features nor forest habitat.	No further recommendations for this species.

		coniferous forest, valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms Mar-Jul.		
island tube lichen <i>Hypogymnia schizidiata</i>	Rank 1B.3	chaparral, closed-cone coniferous forest. Elevation ranges from 1180 to 1330 feet (360 to 405 meters).	No Potential. The Study Area is highly disturbed and does not contain forest nor chaparral habitat.	No further recommendations for this species.
coast iris <i>Iris longipetala</i>	Rank 4.2	coastal prairie, lower montane coniferous forest, meadows and seeps. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May(Jun).	No Potential. The Study Area is highly disturbed and does not contain perennial aquatic features.	No further recommendations for this species.
Burke's goldfields <i>Lasthenia burkei</i>	FE, SE, Rank 1B.1	meadows and seeps, vernal pools. Elevation ranges from 50 to 1970 feet (15 to 600 meters). Blooms Apr-Jun.	No Potential. The Study Area is high disturbed and does not contain vernal pools.	No further recommendations for this species.
perennial goldfields <i>Lasthenia californica ssp. macrantha</i>	Rank 1B.2	coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Jan-Nov.	No Potential. The Study Area is highly disturbed and not located very near the coast.	No further recommendations for this species.
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE, Rank 1B.1	cismontane woodland, playas, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1540 feet (0 to 470 meters). Blooms Mar-Jun.	No Potential. The Study Area is highly disturbed and does not contain vernal pool habitat.	No further recommendations for this species.
legenere <i>Legenere limosa</i>	Rank 1B.1	vernal pools. Elevation ranges from 5 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	No Potential. The Study Area does not contain vernal pool habitat.	No further recommendations for this species.
bristly leptosiphon <i>Leptosiphon acicularis</i>	Rank 4.2	chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	No Potential. The Study Area is highly disturbed and does not contain woodland or chaparral habitat.	No further recommendations for this species.

large-flowered leptosiphon <i>Leptosiphon grandiflorus</i>	Rank 4.2	cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 4005 feet (5 to 1220 meters). Blooms Apr-Aug.	No Potential. The Study Area lacks the associated species and habitat types.	No further recommendations for this species.
Jepson's leptosiphon <i>Leptosiphon jepsonii</i>	Rank 1B.2	chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 330 to 1640 feet (100 to 500 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and does not contain woodland or chaparral habitat.	No further recommendations for this species.
woolly-headed lessingia <i>Lessingia hololeuca</i>	Rank 3	broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland (serpentine). Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	No Potential. The Study Area is highly disturbed and does not contain serpentine soils.	No further recommendations for this species.
Tamalpais lessingia <i>Lessingia micradenia</i> var. <i>micradenia</i>	Rank 1B.2	chaparral, valley and foothill grassland (serpentine). Elevation ranges from 330 to 1640 feet (100 to 500 meters). Blooms (Jun)Jul-Oct.	No Potential. The Study Area is highly disturbed and does not contain serpentine soils.	No further recommendations for this species.
Mason's lilaepsis <i>Lilaepsis masonii</i>	SR, Rank 1B.1	marshes and swamps, riparian scrub. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Nov.	Unlikely. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.

coast lily <i>Lilium maritimum</i>	Rank 1B.1	broadleafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps, north coast coniferous forest. Elevation ranges from 15 to 1560 feet (5 to 475 meters). Blooms May-Aug.	No Potential. The Study Area is highly disturbed and does not contain chaparral nor forest habitat.	No further recommendations for this species.
Pitkin Marsh lily <i>Lilium pardalinum ssp. pitkinense</i>	FE, SE, Rank 1B.1	cismontane woodland, marshes and swamps, meadows and seeps. Elevation ranges from 115 to 215 feet (35 to 65 meters). Blooms Jun-Jul.	No Potential. The Study Area is highly disturbed and not located within or near Sebastopol.	No further recommendations for this species.
Sebastopol meadowfoam <i>Limnanthes vincularis</i>	FE, SE, Rank 1B.1	meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Apr-May.	No Potential. The Study Area is highly disturbed and does not contain vernal pools..	No further recommendations for this species.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	Rank 3.2	broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 150 to 2705 feet (45 to 825 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and does not contain forest, chaparral, nor woodland habitat.	No further recommendations for this species.
marsh microseris <i>Microseris paludosa</i>	Rank 1B.2	cismontane woodland, closed-cone coniferous forest, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun(Jul).	Unlikely. The Study Area is highly disturbed and does not contain forest or woodland habitat.	No further recommendations for this species.
cotula navarretia <i>Navarretia cotulifolia</i>	Rank 4.2	chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 15 to 6005 feet (4 to 1830 meters). Blooms May-Jun.	No Potential. The Study Area is highly disturbed and does not contain adobe soils.	No further recommendations for this species.

Baker's navarretia <i>Navarretia leucocephala ssp. bakeri</i>	Rank 1B.1	cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	No Potential. The Study Area is highly disturbed and does not contain vernal pools.	No further recommendations for this species.
Marin County navarretia <i>Navarretia rosulata</i>	Rank 1B.2	chaparral, closed-cone coniferous forest (serpentine). Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	No Potential. The Study Area is highly disturbed and does not contain forest or chaparral habitat underlain by serpentine substrate.	No further recommendations for this species.
Gairdner's yampah <i>Perideridia gairdneri ssp. gairdneri</i>	Rank 4.2	broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 2000 feet (0 to 610 meters). Blooms Jun-Oct.	No Potential. The Study Area is highly disturbed and does not contain adobe soils nor forest habitat.	No further recommendations for this species.
North Coast phacelia <i>Phacelia insularis var. continentis</i>	Rank 1B.2	coastal bluff scrub, coastal dunes. Elevation ranges from 35 to 560 feet (10 to 170 meters). Blooms Mar-May.	No Potential. The Study Area is highly disturbed and not located very near the coast.	No further recommendations for this species.
Petaluma popcornflower <i>Plagiobothrys mollis var. vestitus</i>	Rank 1A	marshes and swamps, valley and foothill grassland. Elevation ranges from 35 to 165 feet (10 to 50 meters). Blooms Jun-Jul.	Unlikely. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	ST, Rank 1B.1	broadleafed upland forest, meadows and seeps, north coast coniferous forest. Elevation	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.

		ranges from 35 to 2200 feet (10 to 671 meters). Blooms Apr-Jun.		
nodding semaphore grass <i>Pleuropogon refractus</i>	Rank 4.2	lower montane coniferous forest, meadows and seeps, north coast coniferous forest, riparian forest. Elevation ranges from 0 to 5250 feet (0 to 1600 meters). Blooms (Mar)Apr-Aug.	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
Marin knotweed <i>Polygonum marinense</i>	Rank 3.1	marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms (Apr)May-Aug(Oct).	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
Cunningham Marsh cinquefoil <i>Potentilla uliginosa</i>	Rank 1A	marshes and swamps. Elevation ranges from 100 to 130 feet (30 to 40 meters). Blooms May-Aug.	No Potential. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
Tamalpais oak <i>Quercus parvula</i> var. <i>tamalpaisensis</i>	Rank 1B.3	lower montane coniferous forest. Elevation ranges from 330 to 2460 feet (100 to 750 meters). Blooms Mar-Apr.	No Potential. The Study Area is highly disturbed and does not contain forest habitat.	No further recommendations for this species.
Lobb's aquatic buttercup <i>Ranunculus lobbii</i>	Rank 4.2	cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 50 to 1540	Unlikely. The Study Area is highly disturbed and does not ponded areas of freshwater with at least 18 inch depth	No further recommendations for this species.

		feet (15 to 470 meters). Blooms Feb-May.	such as vernal pools or stock ponds necessary to support this species.	
California beaked-rush <i>Rhynchospora californica</i>	Rank 1B.1	bogs and fens, lower montane coniferous forest, marshes and swamps, meadows and seeps. Elevation ranges from 150 to 3315 feet (45 to 1010 meters). Blooms May-Jul.	No Potential. The Study Area does not contain perennial aquatic features.	No further recommendations for this species.
round-headed beaked-rush <i>Rhynchospora globularis</i>	Rank 2B.1	marshes and swamps. Elevation ranges from 150 to 195 feet (45 to 60 meters). Blooms Jul-Aug.	No Potential. The Study Area does not contain perennial aquatic features.	No further recommendations for this species.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	Rank 1B.2	marshes and swamps. Elevation ranges from 0 to 2135 feet (0 to 650 meters). Blooms May-Oct(Nov).	Unlikely. The Study Area is highly disturbed and does not contain perennial aquatic features.	No further recommendations for this species.
Point Reyes checkerbloom <i>Sidalcea calycosa ssp. rhizomata</i>	Rank 1B.2	marshes and swamps. Elevation ranges from 10 to 245 feet (3 to 75 meters). Blooms Apr-Sep.	No Potential. The Study Area is highly disturbed and does not contain perennial aquatic features.	No further recommendations for this species.
Marin checkerbloom <i>Sidalcea hickmanii ssp. viridis</i>	Rank 1B.1	chaparral. Elevation ranges from 165 to 1410 feet (50 to 430 meters). Blooms May-Jun.	No Potential. The Study Area is highly disturbed and does not contain chaparral habitat.	No further recommendations for this species.
Mount Burdell jewelflower <i>Streptanthus anomalus</i>	Rank 1B.1	cismontane woodland. Elevation ranges from 165 to 490 feet (50 to 150 meters). Blooms May-Jun.	No Potential. The Study Area is highly disturbed and does not contain woodland habitat.	No further recommendations for this species.
Tamalpais jewelflower <i>Streptanthus batrachopus</i>	Rank 1B.3	chaparral, closed-cone coniferous forest. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	No Potential. The Study Area does not contain serpentine soils.	No further recommendations for this species.
Mt. Tamalpais bristly jewelflower <i>Streptanthus glandulosus ssp. pulchellus</i>	Rank 1B.2	chaparral, valley and foothill grassland. Elevation ranges from 490 to 2625 feet (150 to 800 meters). Blooms May-Jul(Aug).	No Potential. The Study Area does not contain serpentine soils.	No further recommendations for this species.

two-fork clover <i>Trifolium amoenum</i>	FE, Rank 1B.1	coastal bluff scrub, valley and foothill grassland. Elevation ranges from 15 to 1360 feet (5 to 415 meters). Blooms Apr-Jun.	Unlikely. The Study Area is highly disturbed and does not contain suitable swale habitat.	No further recommendations for this species.
Santa Cruz clover <i>Trifolium buckwestiorum</i>	Rank 1B.1	broadleaved upland forest, cismontane woodland, coastal prairie. Elevation ranges from 345 to 2000 feet (105 to 610 meters). Blooms Apr-Oct.	No Potential. The Study Area is highly disturbed and does not contain woodland or forest habitat.	No further recommendations for this species.
saline clover <i>Trifolium hydrophilum</i>	Rank 1B.2	marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	Unlikely. Although the Study Area contains a coastal salt marsh fringe along McNears Channel, the habitat is limited in its extent and native species diversity, and anthropogenically disturbed, providing only marginal habitat for special-status plants.	No further recommendations for this species.
Pacific Grove clover <i>Trifolium polyodon</i>	SR, Rank 1B.1	closed-cone coniferous forest, coastal prairie, meadows and seeps, valley and foothill grassland. Elevation ranges from 15 to 1395 feet (5 to 425 meters). Blooms Apr-Jun(Jul).	No Potential. The Study Area does not contain springs or streams.	No further recommendations for this species.
San Francisco owl's-clover <i>Triphysaria floribunda</i>	Rank 1B.2	coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 35 to 525 feet (10 to 160 meters). Blooms Apr-Jun.	Unlikely. The Study Area is highly disturbed and is not located very near the coast.	No further recommendations for this species.
coastal triquetrella <i>Triquetrella californica</i>	Rank 1B.2	coastal bluff scrub, coastal scrub. Elevation ranges from 35 to 330 feet (10 to 100 meters).	No Potential. The Study Area is not located very near the coast nor contains coastal habitats.	No further recommendations for this species.

dark-mouthed triteleia <i>Triteleia lugens</i>	Rank 4.3	broadleafed upland forest, chaparral, coastal scrub, lower montane coniferous forest. Elevation ranges from 330 to 3280 feet (100 to 1000 meters). Blooms Apr-Jun.	No Potential. The Study Area does not contain the associated habitats.	No further recommendations for this species.
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WILDLIFE

Mammals

<i>Antrozous pallidus</i> pallid bat	SSC, WBWG High	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various manmade structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Moderate Potential. The Study Area does contain trees and buildings suitable to provide roosting by this species. Additionally, this species was documented in a building less than a mile from the Study Area (CDFW 2022b).	Presence Unknown. Recommendations to reduce potential impacts to pallid bats are described in section 7.1.2.
<i>Arborimus pomo</i> Sonoma tree vole	SSC	Occurs in old-growth and other forests, mainly those of Douglas-fir, redwood, and montane hardwood-conifer. Closely associated with Douglas fir; however, recent observations from the North Coast have documented this species in other coniferous forests.	No Potential. The Study Area does not contain Douglas fir or forested habitat this species needs for foraging and nesting. There are no documented occurrences within 5 miles of the Study Area (CDFW 2020).	Not Present. Suitable habitat is absent. No further recommendations for this species.
<i>Corynorhinus townsendii</i> <i>townsendii</i>	SSC, WBWG High	Humid coastal regions of northern and central California. Roost in limestone caves, lava tubes,	Moderate Potential. The Study Area contains structures	Presence Unknown. Recommendations to reduce potential impacts

Townsend's western big-eared bat		mines, buildings etc. Will only roost in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to disturbance	that may provide roosting habitat for this species.	to Townsend's western big-eared bat are described in section 7.1.2.
<i>Lasiurus blossevillii</i> western red bat	SSC, WBWG High	Highly migratory and typically solitary, roosting primarily in the foliage of trees or shrubs. It is associated with broad-leaved tree species including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	Unlikely. Study Area does not contain broad leafed trees suitable for roosting. The Study Area does have open areas, therefore this species may be observed foraging within the Study Area.	Presumed Absent. Suitable roosting habitat is absent. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Myotis thysanodes</i> fringed myotis	WBWG High	Associated with a wide variety of habitats including dry woodlands, desert scrub, mesic coniferous forest, grassland, and sage-grass steppes. Building, mines, and large trees and snags are important day and night roosts.	Moderate Potential. The Study Area contains some structures that may support roosting.	Presence Unknown. Recommendations to reduce potential impacts to fringed myotis are described in section 7.1.2.
<i>Myotis volans</i> long-legged myotis	WBWG High	Primarily found in coniferous forests, but also occurs seasonally in riparian and desert habitats. Large hollow trees, rock crevices, buildings, mines, and caves are important day roosts.	Moderate Potential. The Study Area contains some structures that may support roosting.	Presence Unknown. Recommendations to reduce potential impacts to long-legged myotis are described in section 7.1.2.
<i>Pekania pennanti</i> fisher	FC, SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning.	No Potential. The Study Area does not contain coniferous forest habitat to support nesting or foraging of this species.	Not Present. Suitable habitat is absent. No further recommendations for this species.

Need large areas of mature, dense forest.

<i>Reithrodontomys raviventris</i> salt marsh harvest mouse	FE, SE, SFP	Endemic to emergent salt and brackish wetlands of the San Francisco Bay Estuary. Pickleweed marshes are primary habitat; also occurs in various other wetland communities with dense vegetation. Does not burrow, builds loosely organized nests. Requires higher areas for dryland refugia during high tides.	No Potential. The Study Area does not contain pickleweed that this species needs for foraging and nesting. There nearest documented occurrence is 1.5 miles south of the Study Area in marsh habitat along to Petaluma River (CDFW 2022b).	Not Present. Suitable habitat is absent. No further recommendations for this species.
<i>Sorex ornatus sinuosus</i> Suisun shrew	SSC	Tidal marshes of the northern shores of San Pablo and Suisun bays. Require dense low-lying vegetation cover, driftwood, and other litter above the mean high tide line for nesting and foraging.	No Potential. The Study Area does not contain tidal marsh habitat.	Not Present. Suitable habitat is absent. No further recommendations for this species.
<i>Taxidea taxus</i> American badger	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	Unlikely. The Study Areas do not contain suitable habitat necessary to support this species. The area is primarily developed and soils are compacted. Additionally, the area is surrounded on several sides by water and/or dense urban development	Presumed Absent. Suitable habitat is absent. No further recommendations for this species.
Birds				
<i>Agelaius tricolor</i> tricolored blackbird	SC (E), SSC	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or	Unlikely. The Study Area does not support the dense marsh vegetation necessary for nesting. The nearest documented occurrence is	Not Present. Suitable nesting habitat is absent. The species may occasionally forage over or in the Study Area. No further

		riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	over 5 miles south of the Study Area (CDFW 2022b).	recommendations for this species.
<i>Ammodramus savannarum</i> grasshopper sparrow	SSC	Summer resident. Breeds in open grasslands in lowlands and foothills, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.	Unlikely. The Study Area does not contain low to moderately high grassland, further it is surrounded by urban development. The nearest documented occurrence is 7 miles east of the Study Area (CDFW 2022b).	Not Present. Suitable nesting habitat is absent. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Aquila chrysaetos</i> golden eagle	BGEPA, SFP	Occurs year-round in rolling foothills, mountain areas, sage-juniper flats, and deserts. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees, usually within otherwise open areas.	No Potential. Suitable habitat for nesting is not present and the Study Area lacks adequate foraging areas and is in an urbanized area. The species may occasionally forage over or in the Study Area.	Not Present. Suitable nesting habitat is absent. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Ardea alba</i> great egret	no status (breeding sites protected by CDFW)	Year-round resident. Nests colonially or semi-colonially, usually in trees, occasionally on the ground or elevated platforms. Breeding sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	No Potential to Nest. The Study Area lacks clusters of trees in proximity to aquatic features with extended inundation periods. The species is likely to forage within the Study Area.	Nests Not Present. Suitable nesting habitat is absent. The species may be likely to forage over or in the Study Area. No further recommendations for this species.
<i>Ardea herodias</i> great blue heron	no status (breeding sites)	Year-round resident. Nests colonially or semi-colonially in tall trees and cliffs, also sequestered terrestrial substrates. Breeding	No Potential to Nest. The Study Area lacks clusters of trees in proximity to aquatic features with extended	Nests Not Present. Suitable nesting habitat is absent. The species is likely to forage over or in

	protected by CDFW)	sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	inundation periods. The species is likely to forage in the Study Area.	the Study Area. No further recommendations for this species.
<i>Asio flammeus</i> short-eared owl	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	No Potential to Nest. The Study Area lacks elevated areas that would support nesting and dense herbaceous vegetation for roosting and nesting.	Not Present. Suitable habitat for nesting or foraging is Not Present. No further recommendations for this species.
<i>Asio otus</i> long-eared owl	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	No Potential to Nest. The Study Area lacks forests and tree groves that would support nesting.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.
<i>Athene cunicularia</i> burrowing owl	SSC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches, and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows,	Unlikely. Suitable burrows for occupation and nesting are not present. Widely regarded to only be a winter visitor to Sonoma County.	Presumed Absent. No further recommendations for this species.

most commonly those of ground squirrels.

<i>Brachyramphus marmoratus</i> marbled murrelet	FT, SE	Primarily coastal marine but breeds in old-growth redwood stands containing platform-like branches along the coast. Migrates daily from inland nests and roosts to forage in the Pacific Ocean.	No Potential. Suitable forests for nesting are not present.	Not Present. Suitable habitat for this species is not present. No further recommendations for this species.
<i>Buteo swainsoni</i> Swainson's hawk	ST	Summer resident in Central Valley and limited portions of the southern California interior. Nests in tree groves and isolated trees in riparian and agricultural areas, including near buildings. Forages in grasslands and scrub habitats as well as agricultural fields, especially alfalfa. Preys on arthropods year-round as well as smaller vertebrates during the breeding season.	Unlikely. The Study Area is not within the known breeding range of this species. This species is presumed extirpated from the Petaluma Area (CDFW 2022b).	Presumed Absent. Habitat is absent and the species has not been documented to nest nearby. No further recommendations for this species.
<i>Charadrius alexandrinus nivosus</i> western snowy plover	FT, SSC	Federal listing applies only to the Pacific coastal population. Year-round resident and winter visitor. Occurs on sandy beaches, salt pond levees, and the shores of large alkali lakes. Nests on the ground, requiring sandy, gravelly or friable soils.	No Potential. Suitable beaches for nesting are not present. No beach habitats are present that would facilitate foraging.	Not Present. Suitable habitat for this species is Not Present. No further recommendations for this species.
<i>Circus cyaneus</i> northern harrier	SSC	Year-round resident and winter visitor. Found in open habitats including grasslands, prairies, marshes, and agricultural areas. Nests on the ground in dense	Unlikely to Nest. The Study Area contains no open grassland habitat, and the urban development immediately adjacent to the	Presumed Absent. No further recommendations for this species.

		vegetation, typically near water or otherwise moist areas. Preys on small vertebrates.	Study Area makes this area unlikely to support nesting. The species may occasionally fly over the site and may rarely forage.	
<i>Coccyzus americanus occidentalis</i> western yellow-billed cuckoo	FT, SE	Summer resident, breeding in dense riparian forests and jungles, typically with early successional vegetation present. Utilizes densely foliated deciduous trees and shrubs. Eats mostly caterpillars. Current breeding distribution within California very restricted.	No Potential. The Study Area does not contain dense or well-developed riparian habitat.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.
<i>Contopus cooperi</i> olive-sided flycatcher	SSC	Summer resident. Typical breeding habitat is montane coniferous forests. At lower elevations, also occurs in wooded canyons and mixed forests and woodlands. Often associated with forest edges. Arboreal nest sites located well off the ground.	No Potential. Suitable forests or woodlands for nesting are not present. Additionally, the Study Area is surrounded by urban development.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.
<i>Coturnicops noveboracensis</i> yellow rail	SSC	Summer resident in eastern Sierra Nevada, breeding in shallow freshwater marshes and wet meadows with dense vegetation. A rare winter visitor along the coast and other cismontane areas. Extremely cryptic.	No Potential. Suitable marshes and/or wet meadows with dense vegetation are absent in the Study Area.	Not Present. Suitable habitat for nesting and foraging is not present. No further recommendations for this species.
<i>Cypseloides niger</i> black swift	SSC	Summer resident with a fragmented breeding distribution; most occupied areas in California either montane or coastal. Breeds in small colonies on cliffs	No Potential. Cliffs, bluffs, and waterfalls are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.

behind or adjacent to waterfalls, in deep canyons, and sea-bluffs above surf. Forages aerially over wide areas.

<i>Dendroica petechia brewsteri</i> (Brewster's) yellow warbler	SSC	Summer resident throughout much of California. Breeds in riparian vegetation close to water, including streams and wet meadows. Microhabitat used for nesting is variable, but dense willow growth is typical. Occurs widely on migration.	No Potential to Nest. Riparian areas and dense vegetation of adequate structure to support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Elanus leucurus</i> white-tailed kite	SFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes, and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	Moderate Potential. Trees within the vicinity of the Study Area could support nesting for this species. This species may be seen foraging within the Study Area.	Presence Unknown. Additional surveys to determine if the species is nesting in the Study Area are described in Section 7.1.2 and should be applied if work occurs in the nesting season.
<i>Falco peregrinus anatum</i> American peregrine falcon	SE, SFP	Year-round resident and winter visitor. Occurs near water, including coastal areas, wetlands, lakes, and rivers. Usually nests on sheltered cliffs or tall man-made structures. Preys primarily on waterbirds.	No Potential to Nest. Cliffs and other structures that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Fratercula cirrhata</i> tufted puffin	SSC	Pelagic and coastal marine. Nests near or along the coast on islands, islets, and (rarely) isolated mainland cliffs. Requires sod or earth into which the birds can	No Potential. The Study Area is not located along ocean bluffs.	Not Present. No suitable habitat for nesting is present. No potential for foraging.

		burrow, or rocky crevices where friable soil is absent. Forages at sea, primarily for fish.		
<i>Geothlypis trichas sinuosa</i> San Francisco (saltmarsh) common yellowthroat	SSC	Resident of the San Francisco Bay region, in fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	No Potential to Nest. Vegetation that could support nesting is absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Haliaeetus leucocephalus</i> bald eagle	BGEPA, SE, SFP	Occurs year-round in California, but primarily a winter visitor; breeding population is growing. Nests in large trees in the vicinity of larger lakes, reservoirs, and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	No Potential to Nest. The Study Area does not contain large trees adjacent to large water bodies of water to support nesting of this species. Additionally, due to the developed nature of the Petaluma River, foraging habitat within the Study Area along the river is reduced.	Not Present. Suitable habitat for nesting and foraging is not present. The species may occasionally fly over the Study Area. No further recommendations for this species.
<i>Icteria virens</i> yellow-breasted chat	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow (<i>Salix</i> spp.), blackberry (<i>Rubus</i> spp.), and wild grape (<i>Vitis californicus</i>).	No Potential to Nest. Riparian areas that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Lanius ludovicianus</i> loggerhead shrike	SSC	Year-round resident in open woodland, grasslands, savannah, and scrub. Prefers areas with sparse shrubs, trees, posts, and	Unlikely. The Study Area is surrounded by development and the percentage of suitable habitat within it is relatively	Presumed Absent. Suitable habitat for nesting is mostly absent. The species may

		other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely foliaged shrubs or trees.	small. It is unlikely that this species would find adequate foraging and nesting opportunities in the Study Area.	occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Laterallus jamaicensis coturniculus</i> California black rail	ST, SFP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	No Potential to Nest. Vegetation types that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.
<i>Melospiza melodia samuelis</i> San Pablo song sparrow	SSC	Year-round resident of tidal marshes along the north side of San Francisco and San Pablo Bays. Typical habitat is dominated by pickleweed, with gumplant and other shrubs present in the upper zone for nesting. May forage in areas adjacent to marshes.	Unlikely. Vegetation that could support nesting is present but too sparse in the Study Area. The species may forage in the Study Area.	Presumed Absent. The species may occasionally forage over or in the Study Area. This subspecies is generally considered to be associated with larger tidal margins than are present and it is not likely to nest onsite. No further recommendations for this species.
<i>Nycticorax nycticorax</i> black-crowned night heron	no status (breeding sites protected by CDFW)	Year-round resident. Nests colonially, usually in trees but also in patches of emergent vegetation. Rookery sites are often on islands and usually located adjacent to foraging areas: margins of lakes and bays.	No Potential to Nest. Clusters of trees and emergent vegetation that could support nesting are absent. The species may forage in the Study Area.	Not Present. Suitable habitat for nesting is not present. The species may occasionally forage over or in the Study Area. No further recommendations for this species.

<i>Passerculus sandwichensis alaudinus</i> Bryant's savannah sparrow	SSC	Year-round resident associated with the coastal fog belt, primarily between Humboldt and northern Monterey Counties. Occupies low tidally influenced habitats and adjacent areas, including grasslands. Also uses drier, more upland coastal grasslands. Nests near the ground in taller vegetation, including along levees and canals.	No Potential to Nest. Vegetation that could support nesting are absent in the Study Area and the Study Area is further from the coast than typical for this species.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.
<i>Progne subis</i> purple martin	SSC	Summer resident. Inhabits woodlands and low-elevation coniferous forests. Nests in old woodpecker cavities and man-made structures (bridges, utility towers). Nest is often located in tall, isolated tree or snag.	No Potential to Nest. Trees and other structures that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.
<i>Rallus obsoletus obsoletus</i> California Ridgway's (clapper) rail	FE, SE, SFP	Year-round resident in tidal marshes of the San Francisco Bay estuary. Requires tidal sloughs and intertidal mud flats for foraging, and dense marsh vegetation for nesting and cover. Typical habitat features abundant growth of cordgrass and pickleweed. Feeds primarily on mollusks and crustaceans.	No Potential to Nest. Habitat and associated vegetation types that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting and foraging is not present. No further recommendations for this species.
<i>Riparia riparia</i> bank swallow	ST	Summer resident in riparian and other lowland habitats near rivers, lakes and the ocean in northern California. Nests colonially in excavated burrows on vertical cliffs and bank cuts	No Potential to Nest. Vertical banks that could support nesting are absent in the Study Area.	Not Present. Suitable habitat for nesting is not present. No further recommendations for this species.

(natural and manmade) with fine-textured soils. Historical nesting range in southern and central areas of California has been eliminated by habitat loss. Currently known to breed in Siskiyou, Shasta, and Lassen Cos., portions of the north coast, and along Sacramento River from Shasta Co. south to Yolo Co.

<i>Sternula antillarum browni</i> California least tern	FE, SE, CFP	Summer resident along the coast from San Francisco Bay south to northern Baja California; inland breeding also very rarely occurs. Nests colonially on barren or sparsely vegetated areas with sandy or gravelly substrates near water, including beaches, islands, and gravel bars. In San Francisco Bay, has also nested on salt pond margins.	No Potential. The Study Area does not contain barren or sparsely vegetated beaches or pond margins.	Not Present. Suitable nesting habitat is not present. Species may occasionally forage over or in the Study Area.
<i>Strix occidentalis caurina</i> northern spotted owl	FT,ST, SSC	Year-round resident in dense, structurally complex forests, primarily those with stands of mature conifers. Uses both coniferous and mixed (coniferous hardwood) forests in some areas. Nests on platform-like substrates in the forest canopy, including in tree cavities. Preys on mammals.	No Potential to Nest. Forests that could support nesting or foraging are absent in the Study Area.	Not Present. Suitable habitat is not present. No further recommendations for this species.
<i>Xanthocephalus xanthocephalus</i> yellow-headed blackbird	SSC	Summer resident. Breeds colonially in freshwater emergent wetlands with dense vegetation and deep water, often along	No Potential. Extensive freshwater emergent wetlands are absent in the Study Area. The species may occasionally	Not Present. Suitable habitat for nesting is not present. No further

borders of lakes or ponds. Requires abundant large insects such as dragonflies; nesting is timed for maximum emergence of insect prey.

forage over or in the Study Area.

recommendations for this species.

Reptiles and Amphibians

<p><i>Ambystoma californiense</i> California tiger salamander, Sonoma County Distinct Population Segment</p>	<p>FE, ST</p>	<p>Occurs in grasslands, oak savannah, and open woodlands with a mosaic of vernal pools or similar seasonal wetlands. Requires vernal pools or similarly inundated waters for breeding and larvae. Adults are fossorial utilizing small mammal burrows for estivation.</p>	<p>No Potential. The Study Area is outside the known range of this species within the Santa Rosa Plain (USFWS 2022b) and does not contain seasonal pool habitat. A historical record that maps to the City of Petaluma is present in the CNDDDB, but the record has no provenance and was mapped based on the home of the collector not the collection location (CDFW 2022b).</p>	<p>Not Present. Suitable habitat for this species is absent. The Study Area is outside of the documented range for the species. No further recommendations for this species.</p>
<p><i>Chelonia mydas</i> Green sea turtle</p>	<p>FT (west coast populations)</p>	<p>Found in fairly shallow waters inside reefs, bays and inlets with marine grass and algae. Open beaches with a sloping platform and minimal disturbance are required for nesting. This species exhibits high site fidelity.</p>	<p>Unlikely. This species is uncommon along the California coast. This turtle prefers warm waters and only a few sightings have been documented in the San Francisco Bay Area.</p>	<p>Not Present. Suitable habitat for this species is not present. No further recommendations for this species.</p>
<p><i>Dicamptodon ensatus</i> California giant salamander</p>	<p>SSC</p>	<p>Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent</p>	<p>No Potential. No cool streams or moist forests are present in the Study Area.</p>	<p>Not Present. Suitable habitat for this species is not present. No further recommendations for this species.</p>

streams. Larvae usually remain aquatic for over a year.

<i>Emys marmorata</i> Pacific (western) pond turtle	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	Unlikely. The Study Area is adjacent to the Petaluma River and pond turtles may rarely use the banks of the river for basking in this area. The frequency of human activity in the Study Area makes it unlikely that pond turtle would occupy the area for extended periods or use it for nesting.	Presumed Absent. This species may occasionally transit the Study Area, but the extent of surrounding urbanization now makes that unlikely. No further recommendations for this species.
<i>Rana boylei</i> foothill yellow-legged frog	SC (T), SSC	Found in or near rocky streams in a variety of habitats; highly aquatic. Prefers partially sunlit, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on invertebrates (aquatic and terrestrial).	No Potential. The Study Area does not contain rocky streams.	Not Present. Suitable habitat (rocky streams) for this species is not present. No further recommendations for this species.
<i>Rana draytonii</i> California red-legged frog	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense emergent and/or overhanging riparian vegetation. Favors perennial to intermittent ponds, marshes, and stream pools. Requires 11 to 20 weeks of continuous inundation for larval development. Disperses through upland habitats during and after rains.	Unlikely. The Study Area lacks suitable freshwater aquatic habitat with emergent vegetation. Surrounding aquatic habitat is saline. Terrestrial pathways into the site are urbanized. Upland refuge is rare or absent.	Presumed Absent. No further recommendations for this species.

<i>Taricha rivularis</i> red-bellied newt	SSC	Inhabits coastal forests from southern Sonoma County northward, with an isolated population in Santa Clara County. Typical habitat is coast redwood forest, but can inhabit hardwood forests. Adults are terrestrial and fossorial. Breeding occurs in rocky streams, usually with relatively strong flows.	No Potential. The Study Area does not contain forest habitat to support this species. Additionally, suitable seasonal pool habitat to support breeding is not present within the Study Area.	Not Present. Suitable habitat (rocky streams with surrounding forests) for this species is not present. No further recommendations for this species.
Fishes				
<i>Eucyclogobius newberryi</i> tidewater goby	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. Requires fairly still but not stagnant water and high oxygen levels.	No Potential. This species is extirpated from San Francisco Bay.	Not Present. Suitable habitat for this species is not present. No further recommendations for this species.
<i>Hypomesus transpacificus</i> delta smelt	FT, SE, RP	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt; most often at salinities < 2 ppt.	Unlikely. The species does occur within San Pablo Bay and is believed to move into the lower portions of the Petaluma River; however, there are no known occurrences near the Study Area. Therefore, it is unlikely that the species would occur within the riverine portion of the Study Area.	Not Present. This species is not known to occur this far up the Petaluma River.
<i>Hysteroecarpus traskii</i> <i>pomo</i> Russian River tule perch	SSC	Found in lower elevation streams of the Russian River basin. Requires clear, flowing water with abundant cover. They also require	No Potential. The Study Area is outside the known range of this species.	Not Present. The Study Area is not in the Russian River Basin. No further

		deep (greater than three feet) pool habitat.		recommendations for this species.
<i>Lavinia symmetricus navarroensis</i> Navarro roach	SSC	Found in warm, intermittent streams to cold, well-aerated streams in the Navarro River watershed.	No Potential. The Study Area is outside the known range of this species.	Not Present. No further recommendations for this species.
<i>Lavinia symmetricus parvipinnis</i> Gualala roach	SSC	Occurs only in the Gualala River and its tributaries. Adaptable; found in warm, intermittent streams as well as cold, well-aerated streams.	No Potential. The Study Area is outside the known range of this species.	Not Present. No further recommendations for this species.
<i>Mylopharodon conocephalus</i> hardhead	SSC	Known from mid-elevation streams in the Sacramento, San Joaquin, and Russian River drainages. Prefer clear, deep pools with sand-gravel-boulder bottoms and slow water velocity.	No Potential. The Study Area is outside the known range of this species.	Not Present. No further recommendations for this species.
<i>Oncorhynchus kisutch</i> coho salmon – central CA coast ESU	FE, SE	Occurs in inland and coastal rivers, and marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also requires riparian cover to contribute to cool, well-aerated water. Federal listing applies to populations between Punta Gorda and San Lorenzo River. State listing applies populations south of San Francisco Bay only.	No Potential. Coho salmon are considered extirpated from San Francisco Bay and tributaries.	Not Present. Suitable habitat for this species is Not Present. No further recommendations for this species.
<i>Oncorhynchus mykiss irideus</i> steelhead - central CA coast DPS	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is Critical Habitat for this species. Although the Study Area does	See recommendations in Section 7.1.2.

		streams. Juveniles remain in fresh water for one or more years before migrating downstream to the ocean.	not provide suitable spawning habitat, this species has a moderate potential to occur during migration, or use the Study Area to forage. The nearest documented occurrence is 3 miles east of the Study Area (CDFW 2022b).	
<i>Acipenser medirostris</i> green sturgeon	FT, SSC	Spawn in the Sacramento River and the Feather River. Spawn at temperatures between 8-14 degrees C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	Unlikely. The aquatic portion of the Study Area occurs within the Petaluma River, which is Critical Habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration, or use the Study Area to forage.	See recommendations in Section 7.1.2.
<i>Acipenser transmontanus</i> white sturgeon	SSC	Found in most estuaries along the Pacific coast. Adults in the San Francisco Bay Estuary system spawn in the Sacramento River and are not known to enter freshwater or non-tidal reaches of Estuary streams. Spawn May through June.	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration, or use the Study Area to forage.	See recommendations in Section 7.1.2.
<i>Entosphenus (=Lampetra) tridentatus</i> Pacific lamprey	SSC	Spawns between March and July in gravel bottomed streams in riffle habitat. Larvae drift downstream to areas of low velocity and fine substrates and	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species.	See recommendations in Section 7.1.2.

		are relatively immobile in the stream substrates.	Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration.	
<i>Lampetra ayresi</i>) river lamprey	SSC	Little is known about habitat requirements in California, but presumably, the adults need clean, gravelly riffles in permanent streams for spawning, while the ammocetes require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 25°C. Adults migrate back into fresh water in the fall and spawn during the winter or spring months in small tributary streams.	Moderate Potential. The aquatic portion of the Study Area occurs within the Petaluma River, which is habitat for this species. Although the Study Area does not provide suitable spawning habitat, this species has a potential to occur during migration.	See recommendations in Section 7.1.2.
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	SSC	Formerly endemic to the lakes and rivers of the Central Valley, but now confined to the Sacramento Delta, Suisun Bay and associated marshes. Occurs in slow-moving river sections and dead-end sloughs. Requires flooded vegetation for spawning and foraging for young. A freshwater species, but tolerant of moderate salinity (10-18 parts per thousand).	Moderate Potential. This species has been documented within the vicinity of the Study Area in the Petaluma River (CDFW 2020). Although the Study Area does not contain flooded vegetation required for spawning, this species may forage in the riverine portion of the Study Area.	See recommendations in Section 7.1.2.

<i>Spirinchus thaleichthys</i> longfin smelt	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	Unlikely. The Study Area is located outside of the known range of this species (UCDAVIS 2022). The species does occur within San Pablo Bay, and is believed to move into the lower portions of the Petaluma River; however, there are no known occurrences near the Study Area which is over 13 miles upstream from the confluence. Therefore, it is unlikely that the species would occur within the riverine portion of the Study Area.	Assumed Absent. No further actions are recommended.
Invertebrates				
<i>Callophrys mossii bayensis</i> San Bruno elfin butterfly	FE	Limited to the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on in rocky outcrops and cliffs in coastal scrub habitat on steep, north-facing slopes within the fog belt. Species range is tied to the distribution of the larval host plant, <i>Sedum spathulifolium</i> .	No Potential. The Study Area does not contain rocky outcrops nor contain known host plant. Additionally, this species is limited to San Mateo County.	Not Present. No suitable habitat is present. No further recommendations.
<i>Danaus plexippus</i> monarch butterfly	roosting sites protected by CDFW; FC	Winter roost sites along the coast from Baja California north to Mendocino County. Roosts are wind-protected tree groves, typically of eucalyptus (<i>Eucalyptus</i> spp.), Monterey pine (<i>Pinus radiata</i>), and Monterey cypress (<i>Hesperocyparis macrocarpa</i>).	Unlikely. The Study Area does not contain trees to support a winter roost of this species. Suitable coastal habitat is over 5 miles from the Study Area (CDFW 2022b).	Not Present. Suitable habitat for this species is Not Present. No further recommendations for this species.

<i>Speyeria zerene behrensii</i> Behren's silverspot butterfly	FE	Inhabits coastal terrace prairie habitat. Larval plant is dog violet (<i>Viola adunca</i>). Known from six historic locations from City of Mendocino to Salt Point; currently considered extant from Point Arena south to Salt Point.	Unlikely. The Study Area is surrounded by urban development and the larval food plant to support this species is not present within the Study Area.	Not Present. Suitable habitat for this species is Not Present. No further recommendations for this species.
<i>Syncaris pacifica</i> California freshwater shrimp	FE, SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	Unlikely. The Study Area does not contain water features to support this species. Additionally, areas adjacent to the Study Area lack riparian cover typical of this species. The nearest documented occurrence of this species is approximately 10 miles east of the Study Area (CDFW 2022b).	Not Present. Suitable habitat for this species is Not Present. No further recommendations for this species.

Appendix D – Site Photographs

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Photograph 1. Photograph depicting Developed/landscaped/disturbed area showing the oyster processing plant in the background. The buildings in the far background are across the Petaluma River, outside of the Study Area. Photograph taken January 11, 2022.



Photograph 2. Photograph depicting ruderal herbaceous grassland in the northern parcel, and a social trail crossing the parcel. Landscaped trees can be seen in the background. Photograph taken January 11, 2022.



Photograph 3. Photograph depicting coastal tidal marsh fringe and open water of McNear Channel to the right. Photograph taken January 11, 2022.



Photograph 4. Photograph depicting the open water tidal channel of Petaluma River in the southern edge of the Study Area. Photograph taken January 11, 2022.