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## BIOLOGICAL RESOURCES ASSESSMENT 240-250 CASA GRANDE RD

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## ATTACHMENTS

Attachment A Preliminary Research Data  
Attachment B NRCS Soil Report

## 1.0 INTRODUCTION

This Biological Resources Assessment (BRA) analyzes potential environmental impacts associated with a proposed housing development project (Proposed Project) located on an approximately 4.5-acre property at 240-250 Casa Grande Road, City of Petaluma, Sonoma County, California (Project Site). The Project Site is identified by Sonoma County Assessor's Parcel Numbers (APN) 017-040-020-000 and 017-040-059-000. A biological survey was conducted on the Project Area on February 20, 2019. Survey methodologies, potentially occurring sensitive biological resources, survey results, impact minimization efforts, and recommended mitigation measures are presented herein.

### 1.1 PROJECT LOCATION

Regional access is provided by Lakeville Highway (Route 116) which runs in an east-west direction approximately 0.5 miles south of the Project Site, and U.S. Highway 101, which runs in north-south direction approximately 1.4 miles west of the Subject Property (**Figure 1**). Local access to the Subject Property is provided by Casa Grande Road, a four-lane road that runs along the northwestern boundary of the Subject Property.

The Project Site consists of approximately 4.5 acres bordered by Casa Grande Road to the northwest, Adobe Creek to the southeast, a housing development to the southwest, and open fields to the northeast (**Figure 2**). The Project Site is relatively flat with an average elevation of 44 feet above mean sea level (amsl).

### 1.2 PROJECT DESCRIPTION

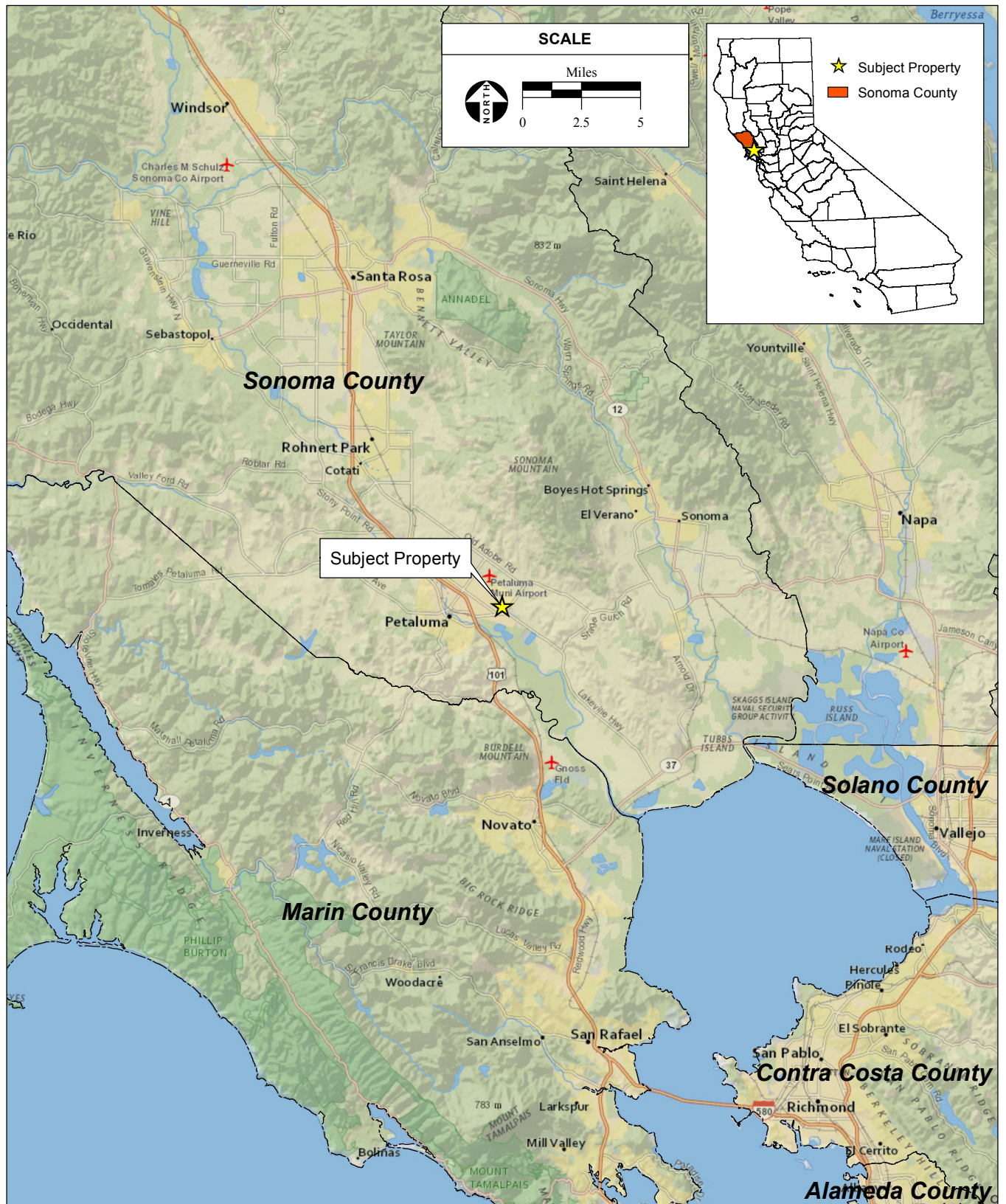
A site plan for the Proposed Project is included as **Figure 3**. The Project Site currently serves as a low-density residential and agricultural use. An existing rental house, abandoned uninhabitable house, large warehouse, and several sheds occur on site. The Proposed Project involves the removal of all these existing structures as well as the agricultural equipment stored on site. A total of 28 detached residential houses are planned for the Project Site. The Proposed Project additionally includes a public roadway connection from Casa Grande Rd. through the development where it will connect with Del Rancho Way. A bioretention pond to detain and treat stormwater runoff is included at the southeastern portion of the Project Site.

## 2.0 REGULATORY SETTING

### 2.1 FEDERAL

#### ***Federal Endangered Species Act (FESA)***

The USFWS and the National Marine Fisheries Service (NMFS) implement the Federal Endangered Species Act (FESA) of 1973 (16 USC Section 1531 et seq.). Threatened and endangered species on the federal endangered species list (50 CFR Subsection 17.11, 17.12) are protected from "take" (direct or indirect harm), unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with incidental take provisions are rendered to a lead federal agency. The USFWS also designates species of concern. Species of concern receive attention from federal agencies during environmental review, although they are not otherwise protected under FESA. Project-related impacts to such species would also be considered significant and require mitigation.

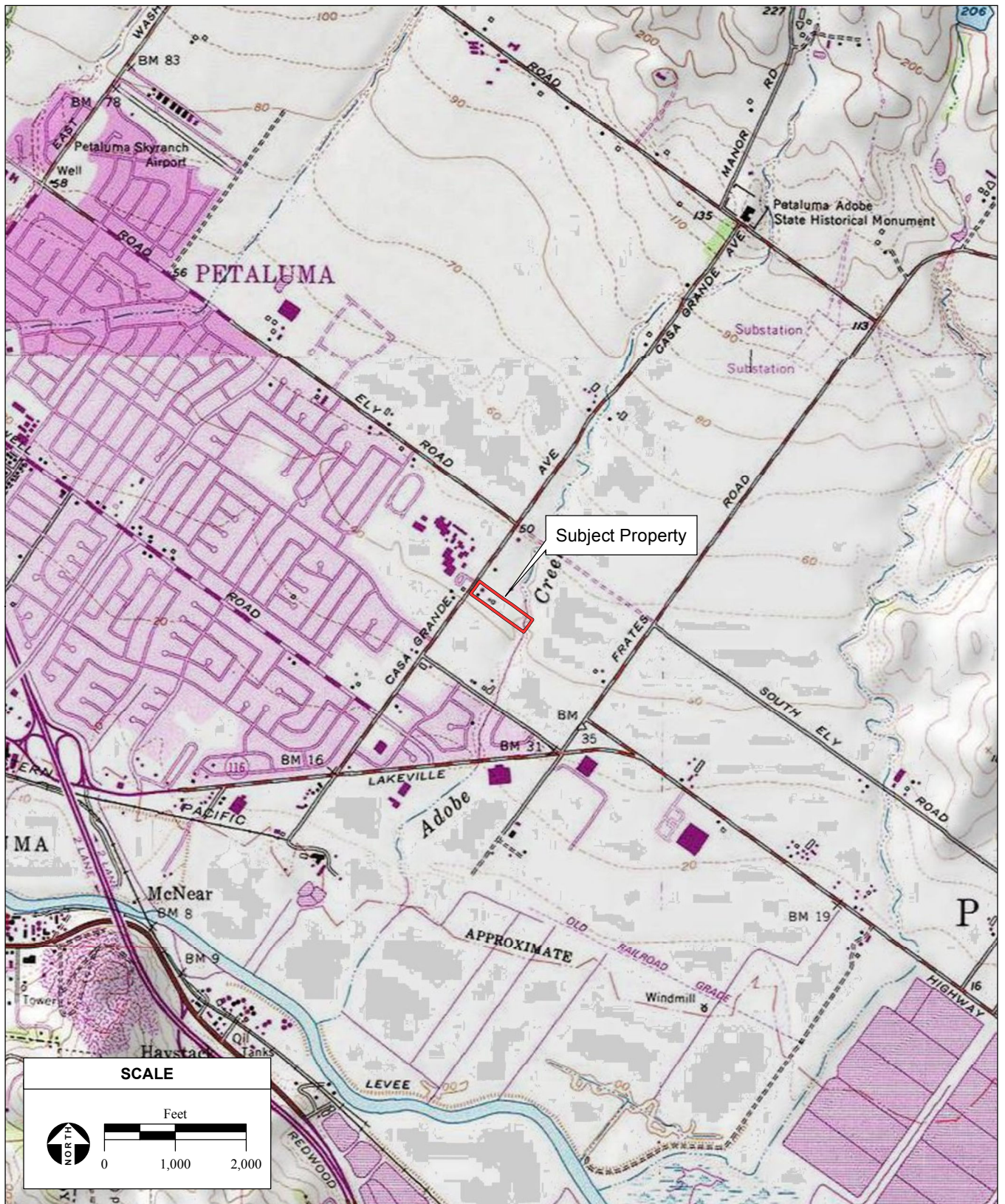


SOURCE: NatGeo, 2019; AES, 9/27/2019

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**Figure 1**  
Regional Location





SOURCE: "Glen Ellen, CA" & "Petaluma River, CA" USGS 7.5 Minute Topographic Quadrangles, T4N R7W, Unsectioned Area of Glen Ellen & Petaluma River, Mt. Diablo Baseline & Meridian; AES, 9/27/2019

240-250 Casa Grande Road Biological Resources Assessment / 219506 ■

**Figure 2**  
Site and Vicinity





**Figure 3**  
Site Plan



### ***Critical Habitat***

Critical habitat is defined under FESA as specific geographic areas within a listed species range that contain features considered essential for the conservation of the listed species. Designated critical habitat for a given species supports habitat determined by USFWS to be important for the recovery of the species. Under FESA, critical habitat loss is considered an impact to the species.

### ***Essential Fish Habitat (EFH)***

Under the Magnuson-Stevens Act, EFH is defined as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH is designated for those fish species with a federal fisheries management plan as determined by the Magnuson-Stevens Act and NMFS. Projects that have the potential to adversely affect EFH must initiate consultation with NMFS. Adverse impacts are any actions that reduce the quality and/or quantity of EFH. Adverse impacts can include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts. Impacts are considered adverse at the level of the individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

### ***Migratory Bird Treaty Act (MBTA)***

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 Code of Federal Regulations (CFR) 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season.

### ***Wetlands and Waters of the U.S. or state***

Any project that involves discharge of dredged or fill material in navigable Waters of the U.S. must first obtain authorization from the U.S. Army Corps of Engineers (USACE), under Section 404 of the CWA. Projects requiring a 404 permit under the CWA also require a Section 401 certification from either USEPA for trust land, or the California Regional Water Quality Control Board (RWQCB) for non-trust land. These two agencies also administer the National Pollutant Discharge Elimination System general permits for construction activities disturbing one acre or more.

The term “Waters of the United States” is defined as:

- All waters currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the flow of the tide;
- All interstate waters including interstate wetlands; or
- All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, where the use or degradation of which could affect interstate or foreign commerce including any such waters.



The term “Wetlands” is defined as:

- Waters of the U.S. that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands that meet these criteria during only a portion of the growing season are classified as seasonal wetlands.

## 2.2 STATE AND LOCAL

### ***California Endangered Species Act (CESA)***

CDFW implements state regulations pertaining to fish and wildlife and their habitat. The California Endangered Species Act (CESA) of 1984 (California Fish and Game Code Section 2050 et seq., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take (interpreted to mean the direct killing of a species) of species listed under CESA (14 CCR Subsection 670.2, 670.5). A CESA permit must be obtained if a proposed project would result in the “take” of listed species, either during construction or over the life of the project. Under CESA, CDFW is responsible for maintaining a list of threatened and endangered species designated under state law (Fish and Game Code Section 2070). CDFW also maintains lists of species of special concern, which serve as “watch lists.” Pursuant to requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state listed species may be present in the project area and determine whether the proposed project would have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and require mitigation.

### ***CEQA Guidelines Title 14***

CEQA guidelines define the objectives, mandates and regulations for those public agencies that administer CEQA and those individuals subject to CEQA regulations. Title 14 of the CEQA Guidelines provides interpretation of regulations for the identification of impacts to natural resources that a CEQA project may have. Title 14 additionally identifies the appropriate agencies that have jurisdiction over specific project types or impacts and provides these agencies with the authority to approve mitigation for those impacts over which they have jurisdiction. This includes the allowance for agency protection of those species not formally listed under FESA or CESA but which still may be considered rare, threatened, or endangered.

The CNPS maintains an extensive list of plant species that it considers to be rare, threatened, or endangered, but have no designated status or protection under federal or state endangered species legislation. Impacts to CNPS listed species (e.g., CNPS list 1 and 2) are considered during CEQA environmental review.

### ***California Fish and Game Code***

The California Fish and Game Code includes provisions against the take of any CDFW Fully Protected Species without a permit. California Fish and Game Code also includes provisions against the needless destruction of eggs and nests.

### *California Native Plant Protection Act*

The California Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 et seq.) requires CDFW to establish criteria for determining if a species or variety of native plant is endangered or rare. The California Native Plant Society (CNPS) inventories the native flora of California and ranks species according to rarity; plants on California Rare Plant Rank (CRPR) list 1 or 2 are “species qualified for listing under CESA” and as such require analysis under CEQA. CRPR 1A plants are presumed extinct in California, CRPR 1B plants rare or endangered in California and elsewhere, and CRPR 2A plants presumed extirpated in California, but more common elsewhere. CRPR 2B plants are rare, threatened, or endangered in California, but are more common elsewhere. CRPR 3 is a watch list for plants about which more information is needed. CRPR 4 is a watch list for plants of limited distribution.

### *Lake or Streambed Alteration Agreement*

CDFW requires a Lake and Streambed Alteration Agreement (LSAA) for all projects that result in the modification of a lake, river or streambed, bank, or channel. Additionally, an LSAA is required for the extraction or deposition of fill material into a lake, river, or stream. Following notification of a project, CDFW determines if the project could substantially adversely affect fish or wildlife resources and if an LSAA is required.

### *City of Petaluma Tree Ordinance*

Any project within the City of Petaluma would require protection of defined protected species as outlined in City of Petaluma municipal code 17.040, or acquisition of the appropriate tree removal permit. This ordinance predominantly protects native oak species as well as several other native species known to occur within Sonoma County.

## **3.0 METHODOLOGY**

### **3.1 PRELIMINARY DATA REVIEW**

Pertinent biological information for the Project Site was obtained from the following sources:

- U.S. Fish and Wildlife Service (USFWS) list of special-status species with the potential to occur on and near the Project Area (USFWS, 2019a; **Attachment A**), obtained September 12, 2019;
- California Natural Diversity Database (CNDDDB) query of special-status species with the potential to occur in the in the Petaluma River 7.5’ minute USGS topographical quad (CDFW, 2019a; **Attachment A**) , obtained September 12, 2019;
- California Native Plant Society (CNPS) query of special-status species known to occur in the Petaluma River 7.5’ minute USGS topographical quad (CNPS, 2019; **Attachment A**), obtained September 12, 2019;
- USFWS National Wetland Inventory mapper for the Project Site (USFWS, 2019b; **Attachment A**);
- Custom Soil Resource Report of the Project Area from the U.S. Department of Agriculture and Natural Resources Conservation Service (NRCS) (NRCS, 2019; **Attachment B**), obtained September 12, 2019; and
- Aerial photography of the Project Site and surrounding area.



### 3.2 SURVEY TECHNIQUES

AES biologists conducted biological resources surveys of the Project Area on February 20 and April 22, 2019. The surveys were conducted by walking meandering transects throughout and around the Project Site. Data was collected via a Trimble Geo XH hand-held GPS receiver. Survey goals consisted of identifying habitat types, sensitive habitats, any potential wetlands and Waters of the U.S., plant and wildlife species, special-status species, and wildlife corridors. Sensitive habitats include those that are designated by CDFW, considered by the appropriate agency be communities of limited distribution, or considered Waters of the U.S. or Waters of the State by regulatory agencies.

Habitat requirements of special-status species were compared to habitats present on and adjacent to the proposed project based on the biological survey, desktop research data, and aerial photographs. Wildlife was identified to the lowest taxonomic level possible. Evidence of wildlife dens, nests, or burrows, if present, were assessed to identify potentially occurring wildlife species on the Project Site. Species and habitat types encountered were classified using the Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities (CDFW, 2018), Botanical Survey Guidelines of the California Native Plant Society (CNPS, 2001), and The Jepson Manual (Baldwin, 2012).

Aerial photos were reviewed to assess habitats surrounding the Project Site for potential wildlife movement or wildlife corridors. Field methodology for identifying corridors for movement included searching for game trails or habitat that would favor movement of wildlife or potential gene flow. Barriers were also looked for as they could prevent or direct movement to particular areas.

## 4.0 ENVIRONMENTAL SETTING

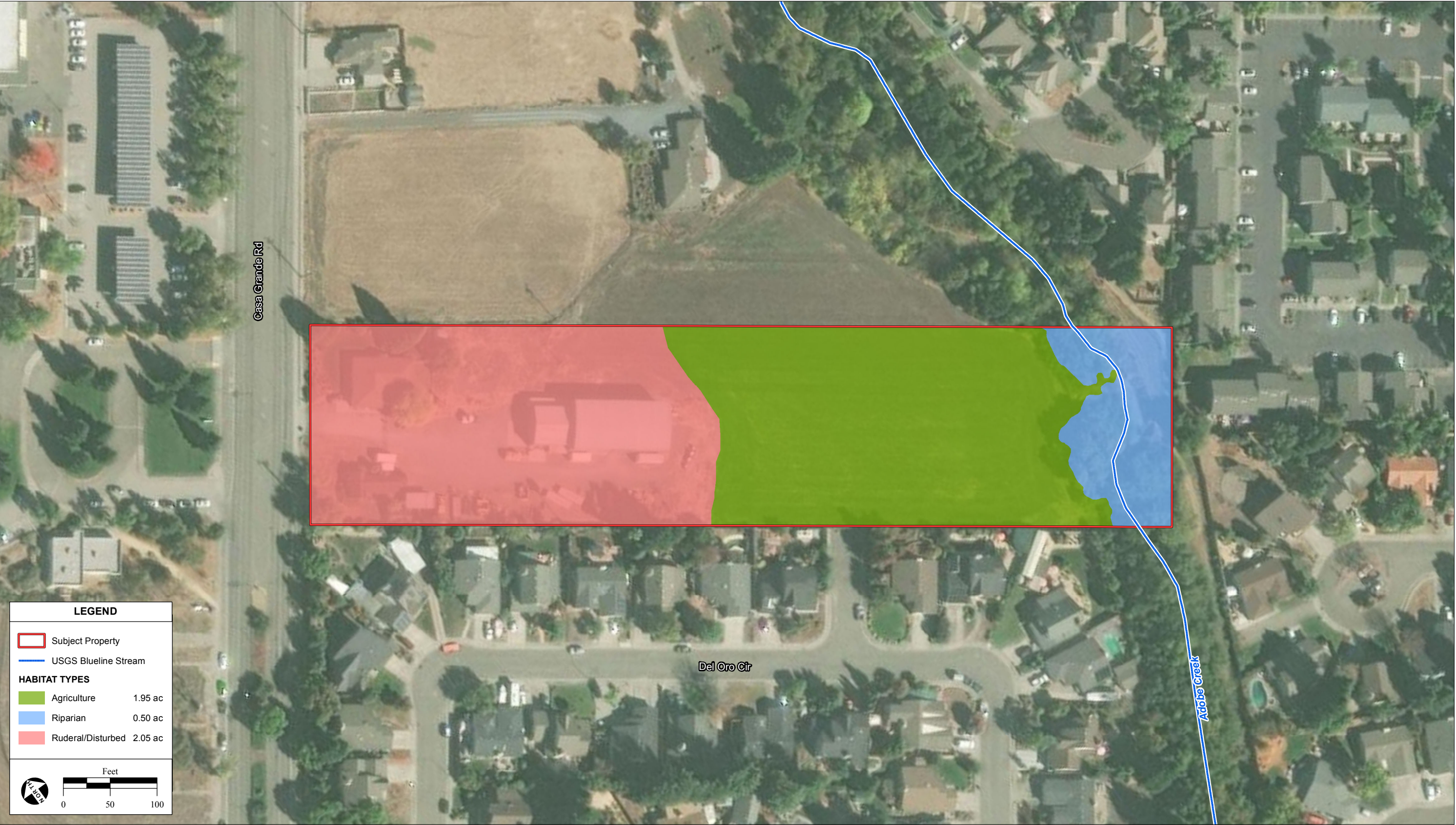
The City of Petaluma is considered part of the northern sub-unit of the San Francisco Bay. Coastal ranges surround generally run from north to south and border Petaluma on the east and west. Climate of the region is heavily influence by the proximity to the coastline. Annual rainfall averages 26.6 inches per year, and annual temperatures range from and average high of 82 in August to an average low of 57 in January (U.S. Climate Data, 2019).

A custom NRCS soil assessment was prepared for the Proposed Project (NRCS, 2019; **Attachment B**). The assessment maps soil units and provides a summary of characteristics of each unit. The Project Area contains Clear Lake clay, 0-2% slopes. Clear Lake clay is categorized as poorly drained and is a soil of statewide farmland importance.

### 4.1 HABITAT TYPES

The Proposed Project consists primarily of developed/ disturbed habitat with a riparian corridor along Adobe Creek on the southeastern portion of the property (**Figure 4**). Site photographs are included as **Figure 5**. Habitat types identified on the Project Area are further discussed below. No USFWS-designated Critical Habitat or NMFS-designated Essential Fish Habitat is present on site (USFWS, 2019c; NMFS 2019). A description of habitats observed within the Project Site are described below.





SOURCE: DigitalGlobe Aerial Photograph, 2017; AES, 9/27/2019

**Figure 4**  
Habitat Types





**PHOTO 1:** Abandoned house in disrepair on the southwest corner of the project site.



**PHOTO 2:** View of Adobe Creek and riparian corridor.



**PHOTO 3:** Existing warehouse/workshop building on site.



**PHOTO 4:** Existing rental unit on the northeast corner of project site. Occupied at the time of the survey.



**PHOTO 5:** Agricultural equipment storage on site between the southwest fence line and graveled parking area.



**PHOTO 6:** Open grassy area between riparian corridor and warehouse. Evidence of disturbance from mowing observed.

### ***Ruderal/Disturbed***

A total of 2.05 acres of the 4.5-acre Project Site are classified as ruderal/disturbed, as shown in **Figure 4**. A gravel driveway off Casa Grande Road provides access to the existing rental home on the northeast corner of the Project Site along with multiple outbuildings. An abandoned house in disrepair, agricultural equipment storage, and a large warehouse structure are accessed through a chain-link fence off the gravel driveway. A large portion of the area surrounding the outbuildings, warehouse, and agricultural equipment storage is characterized by bare ground with compressed gravel for vehicle driving and parking. Those areas not graveled are planted with ornamental species subject to regular landscaping maintenance activities. This habitat type is not considered sensitive and is low quality to plant and wildlife species. Representative photos of this habitat can be seen in Photos 1, 3, 4, and 5 of **Figure 5**.

### ***Riparian***

A riparian corridor exists along Adobe Creek in the southeastern portion of the property (0.5 acres in total), as shown in **Figure 4**. Adobe Creek flows from the Project Site downstream to where it confluences with the Petaluma River thence the San Pablo Bay, thence the San Francisco Bay, thence the Pacific Ocean. Adobe Creek was assessed by the California Department of Fish and Wildlife and was determined to provide suitable habitat for anadromous fishes (CDFW, 2008). A representative photo of Adobe Creek can be seen in Photo 2 of **Figure 5**.

### ***Agricultural***

Approximately 1.95 acres of the site was in forage crops during the 2019 site visit. This area, shown in **Figure 4**, had been disked and planted with *Poa* species for fodder crops. No animals or native plants were observed in this area. A representative photo of this habitat can be seen in Photo 6 of **Figure 5**.

### ***Wetlands and Waters of the U.S.***

A USFWS National Wetlands Inventory map identified Adobe Creek as riverine habitat (USFWS, 2019b; **Attachment A**). Adobe Creek, shown in **Figure 4** and Photo 2 of **Figure 5**, is a USGS blue-line stream and would likely be considered a Water of the U.S. subject to U.S. Army Corps of Engineer (USACE) jurisdiction. No other wetland features were observed on the Project Site during the biological survey.

## **4.2 SPECIAL-STATUS SPECIES**

Special-status species include those afforded protection or listed as endangered, threatened, or are candidates for listing under the regulations described in **Section 2.0**. Preliminary data review have identified 17 special-status plant species and 26 special-status animal species with the potential to occur in the region of the Project Area (USFWS, 2019a; **Attachment A**). The name, regulatory status, distribution, habitat requirements, period of identification, and potential to occur on the Project Area and Project Area for each special-status species are listed in **Table 1**.

Of those 43 regionally occurring special-status species, the Project Site contains suitable habitat to potentially support two special-status plant species and eight special-status animal species. Species with the potential to occur on the Project Site are discussed below. Species with no potential to occur on the Project Site were ruled out based on lack of suitable habitat, soils, elevation, and necessary substrate and are not further discussed.



TABLE 1 - REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<b>PLANTS</b>					
<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	--/--/1B.2	Known to occur in Mendocino, Santa Clara, San Mateo, and Sonoma counties.	Often on dry hillsides with cismontane woodland, valley and foothill grasslands. Grows in clay, volcanic, or serpentinite. Elevations range from 53-305 meters.	May-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	--/--/1B.2	Known to occur in Lake, Monterey, Marin, Napa, and Sonoma counties.	Found in broad-leaved upland forest (openings), chaparral, and cismontane woodland habitats. Elevations range from 0-2000 meters.	April-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Astragalus tener</i> var. <i>tener</i> alkali milk-vetch	--/--/1B.2	Known to occur in Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, Santa Clara, San Francisco, San Joaquin, Solano, Sonoma, Stanislaus, and Yolo counties. However it is presumed extirpated in Contra Costa, Monterey, San Benito, Santa Clara, San Francisco, San Joaquin, Sonoma, and Stanislaus counties.	Found on thin clay or alkaline soils and in playas. Grows in valley and foothill grassland and vernal pools. Elevations range from 1-200 meters.	March-June	<b>No.</b> Suitable habitat for this species not present on site.
<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Point Reyes salty birds-beak	--/--/1B.2	Known to occur in Alameda, Humboldt, Marin, Santa Clara, San Francisco, San Mateo, and Sonoma counties.	An annual herb (hemiparasitic) found in marshes and swamps (coastal salty). Elevations range from 0-10 meters.	Jun-Oct	<b>No.</b> Suitable habitat for this species not present on site.
<i>Chloropyron molle</i> ssp. <i>molle</i> soft salty bird's-beak	FE/CR/1B.2	Known to occur in Contra Costa, Marin (though may be extirpated), Napa, Sacramento (though may be extirpated), Solano, and Sonoma (though may be extirpated) counties.	Marshes and swamps (coastal salt). Elevations: 0-3 meters.	July-November	<b>No.</b> Suitable habitat for this species not present on site.
<i>Chorizanthe valida</i> Sonoma spineflower	FE/CE/1B.1	Known to occur in Marin and Sonoma counties. Only known extant occurrences are in Marin County.	Annual herb found in coastal prairie on sandy soils. Elevations from 10-305 meters.	June-August	<b>No.</b> Suitable habitat for this species not present on site.
<i>Delphinium luteum</i> yellow (golden) larkspur	FE/CR/1B.1	Known to occur in Marin and Sonoma counties	A perennial herb found on cliffs, rocky moist habitats within chaparral, coastal prairie, and coastal scrub habitats. Elevations range from 0-100 meters.	March-May	<b>No.</b> Suitable habitat for this species not present on site.

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Eriogonum luteolum</i> var. <i>caninum</i> Tiburon buckwheat	--/--/1B.2	Known to occur in Alameda, Contra Costa, Marin, and Sonoma counties.	Serpentine, sandy to gravelly soils. Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Elevations from 0-700 meters.	May-September	<b>No.</b> Suitable habitat for this species not present on site.
<i>Fritillaria liliacea</i> fragrant fritillary	--/--/1B.2	Known to occur in Alameda, Contra Costa, Monterey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma counties.	Perennial bulbiferous herb occurs growing on heavy or serpentine soils within open hills, fields near coast, coastal prairie, coastal scrub, valley and foothill grassland, and cismontane woodland. Elevations from: 3-410 meters.	February-April	<b>No.</b> Suitable habitat for this species not present on site.
<i>Hemizonia congesta</i> ssp. <i>congesta</i> congested-headed hayfield tarplant	--/--/1B.2	Known to occur in Lake, Mendocino, Marin, San Francisco, San Mateo and Sonoma counties.	An annual herb occurs in grassy sites, marsh edges, roadsides and valley and foothill grasslands. Elevations: 20-560 meters.	April-November	<b>Yes.</b> Suitable habitat for this species present on site.
<i>Hesperolinon congestum</i> Marin western flax	FT/CT/1B.1	Known to occur in Marin, San Francisco, and San Mateo counties.	Chaparral and Valley and foothill grassland on serpentine soils. Elevations: 5-370 meters.	April-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE/--/1B.1	Known to occur in Alameda, Contra Costa, Mendocino (though may be extirpated), Monterey, Marin, Napa, Santa Barbara (though may be extirpated), Santa Clara (though may be extirpated), and Sonoma counties.	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, and Vernal pools/mesic. Elevations: 0-470 meters.	March-June	<b>No.</b> Suitable habitat for this species not present on site.
<i>Lilium pardalinum</i> ssp. <i>pitkinense</i> Pitkin Marsh lily	FE/CE/1B.1	Known to occur only within the vicinity of Sebastopol, Sonoma County.	Perennial bulbiferous herb found in cismontane woodland, valley-oak scrub, meadows and seeps, and marshes and swamps (freshwater)/mesic, sandy. Elevation: 35-65 meters	June-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	--/--/1B.1	Known to occur in Colusa, Glenn, Lake, Lassen, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo counties.	Annual herb found in mesic conditions within cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools habitats. Elevations range from 5-1740 meters.	April-July	<b>No.</b> Suitable habitat for this species not present on site.

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Plagiobothrys mollis</i> var. <i>vestitus</i> Petaluma popcorn flower	--/--/1A	Known only to Sonoma County.	Marshes and swamps (coastal salt) and Valley and foothill grasslands (mesic). Elevations; 10-50 meters.	June-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i> Point Reyes checkerbloom	--/--/1B.2	Known to occur in Mendocino, Marin, and Sonoma counties.	Marshes and swamps (freshwater, near coast). Elevations range from 3-75 meters.	April-September	<b>No.</b> Suitable habitat for this species not present on site.
<i>Trifolium polyodon</i> Pacific Grove Clover	--/CR/1B.1	Known to occur in Monterey, Marin, Santa Cruz, and Sonoma Counties.	Typically found in wetland habitat of mesic meadows, coastal prairie, closed-cone pine forest, riparian habitat.	April-June (July)	<b>Yes.</b> Suitable habitat for this species present on site.
<b>ANIMALS</b>					
<b>Invertebrates</b>					
<i>Bombus occidentalis</i> western bumble bee	--/CCE/--	Known to occur along the West Coast and Mountain West of North America, including Arizona, New Mexico, Mediterranean California, the Pacific Northwest, and Alaska.	Found in open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Found at elevations from 0-2000+ meters. Nesting occurs underground in abandoned rodent burrows or other cavities.	February- November	<b>Yes.</b> Suitable habitat for this species present on site.
<i>Callophrys mossii</i> <i>bayensis</i> San Bruno elfin butterfly	FE/--/--	Found in coastal mountains near San Francisco Bay, in the fog-belt of steep north facing slopes that receive little direct sunlight. All known locations are restricted to San Mateo County, where several populations are known from San Bruno Mountain, Milagra Ridge, the San Francisco Peninsula Watershed and Montara Mountain.	The San Bruno Elfin Butterfly inhabits rocky outcrops and cliffs in coastal scrub on the San Francisco peninsula. Its host plant, stonecrop ( <i>Sedum spathulifolium</i> ) occurs between 274-328 meters although it also has been known to eat Montara Mountain manzanita ( <i>Arctostaphylos montaraensis</i> ) and huckleberry ( <i>Vaccinium ovatum</i> ). Adult food plants have not been fully determined.	Adults emerge in early spring, in February and March Dormant in loose top soil from June until February of the following year.	<b>No.</b> Suitable habitat for this species not present on site.
<i>Syncaris pacifica</i> California freshwater shrimp	FE/CE/--	Known only throughout Marin, Napa, and Sonoma counties.	Small, low-gradient, perennial coastal streams. Prefers relatively shallow streams with depths of 12-36 inches, exposed live roots of trees such as alder and willow, undercut banks greater than 6 inches, overhanging woody debris or stream vegetation and vines. Elevations range from 0-116 meters.	Consult Agency	<b>No.</b> Suitable habitat for this species not present on site.



SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<b>Fish</b>					
<i>Hypomesus transpacificus</i> delta smelt	FT/CE/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	<b>No.</b> Suitable habitat for this species not present on site.
<i>Oncorhynchus mykiss irideus</i> pop. 8 Steelhead-Central California Coast DPS	FT/--/--	Central California Coastal ESU, spawns in drainages from the Russian River basin, Sonoma and Mendocino Counties, to Soquel Creek, Santa Cruz County (including the San Francisco Bay basin, but not the Sacramento and San Joaquin Rivers or their tributaries).	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	<b>Yes.</b> Suitable habitat for this species present adjacent to the project site. Adobe Creek is Critical Habitat for this species.
<b>Amphibians</b>					
<i>Ambystoma californiense</i> California tiger salamander	FT/CT/--	Occurs in Alameda, Butte, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Solano, Sonoma, Stanislaus, Tulare, and Yolo counties.	Occurs in vernal pools, ephemeral wetlands, and seasonal ponds, including constructed stockponds, in grassland and oak savannah plant communities. Elevations; 0-460 meters.	November to February (adults) March 15 to May15 (larvae)	<b>No.</b> Suitable habitat for this species not present on site.
<i>Rana boylei</i> foothill yellow-legged frog	--/CCT, CSC/--	Known from California and Oregon.	Require shallow, flowing water in moderate sized streams with some cobble substrate.	November-March (breeding) June-August (non-breeding)	<b>Yes.</b> Suitable habitat for this species present on site.
<i>Rana draytonii</i> California red-legged frog	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 meters.	November – March (breeding) June - August (non-breeding)	<b>Yes.</b> Suitable habitat for this species present on site.

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Taricha rivularis</i> red-bellied newt	--/CSC/--	Known to occur in the Coast Range from Mendocino County to San Diego County. Also known in the Peninsular Ranges, south of Boulder Creek, and in the southern Sierra Nevada foothills.	Occurs primarily in valley-foothill hardwood, hardwood-conifer, coastal scrub, and mixed chaparral but may occur in annual grassland and mixed conifer forests. Elevation ranges from sea level to 1,830 meters.	Fall-Late Spring	<b>No.</b> Suitable habitat for this species not present on site.
<b>Reptiles</b>					
<i>Chelonia mydas</i> green sea turtle	FT/--/--	Globally distributed and generally found in tropical and subtropical waters along continental coasts and islands between 30° North and 30° South. In the eastern North Pacific, occurs from Baja California to southern Alaska.	Nests on oceanic beaches, feeds in benthic grounds in coastal areas, and frequents convergence zones in the open ocean.	Consult Agency	<b>No.</b> Suitable habitat for this species not present on site.
<i>Emys marmorata</i> western pond turtle	--/CSC/--	Distribution ranges from Washington to northern Baja California.	Inhabit rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent wetland habitats with basking sites.	Year-round	<b>Yes.</b> Suitable foraging habitat for this species present on site.
<b>Birds</b>					
<i>Athene cunicularia</i> burrowing owl	--/CSC/--	Formerly common within the described habitats throughout the state except the northwest coastal forests and high mountains.	Yearlong resident of open, dry grassland and desert habitats, as well as in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats.	All Year	<b>Yes.</b> Suitable foraging habitat for this species present on site.
<i>Buteo swainsoni</i> Swainson's hawk	--/CT/--	In California, breeds in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, Antelope Valley, and in eastern San Luis Obispo County.	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations.	March – October	<b>Yes.</b> Suitable habitat for this species present on site.



SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Charadrius alexandrinus nivosus</i> western snowy plover	FT/CSC/--	The Pacific coast breeding population of the western snowy plover ( <i>Charadrius alexandrinus nivosus</i> ) currently extends from Damon Point, Washington, to Bahia Magdalena, Baja California, Mexico. The snowy plover winters mainly in coastal areas from southern Washington to Central America (72 FR 184).	Snowy plovers (Pacific coast population) breed primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. In winter, snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in manmade salt ponds, and on estuarine sand and mud flats (72 FR 184).	All Year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Geothlypis trichas sinuosa</i> salt-marsh common yellowthroat	--/CSC/--	Breeding range bounded by Tomales Bay on the north, Carquinez Strait on the east, and Santa Cruz county to south, with occurrences in the Bay Area during migration and winter.	Salt, brackish, and freshwater marshes. Nests just above ground or over water, in thick herbaceous vegetation, often at base of shrub or sapling, sometimes higher in weeds or shrubs up to about 1 m.	March-July	<b>No.</b> Suitable habitat for this species not present on site.
<i>Laterallus jamaicensis coturniculus</i> California black rail	--/CT, FP/--	In coastal California during breeding season, presently found at Bodega Bay, Tomales Bay, Bolinas Lagoon, San Francisco Bay estuary, and Morro Bay. Overwhelming majority of birds in n. San Francisco Bay (San Pablo Bay) at relatively few sites. Occurs irregularly south to Baja California. Inland in small numbers in Salton Trough and on lower Colorado River from Bill Williams River (historically) to Laguna Dam.	Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation. Uses sites with shallower water than other North American rails. Most breeding areas vegetated by fine-stemmed emergent plants, rushes, grasses, or sedges. Sites used in coastal California characterized by taller vegetation, greater coverage and height of alkali heath ( <i>Frankenia grandifolia</i> ).	All Year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Melospiza melodia samuelis</i> San Pablo song sparrow	--/CSC/--	Distributed in marshes around San Pablo Bay continuously from Gallinas Creek in the west, along the northern San Pablo bayshore, and throughout the extensive marshes along the Petaluma, Sonoma, and Napa rivers.	Commonly found in saltmarsh, brackish marsh, salt marsh (altered), brackish marsh (altered), and fringe areas, where marsh vegetation is limited to edges of dikes, landfills, or other margins of high ground bordering salt or brackish water areas.	All Year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Rallus longirostris obsoletus</i> California clapper rail	FE/--/--	Almost exclusively in the San Francisco estuary.	Salt and brackish water marshes. Prefer high densities of pickleweed, and Pacific cordgrass, and require tidal sloughs for cover and foraging.	All year	<b>No.</b> Suitable habitat for this species not present on site.

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Rallus obsoletus obsoletus</i> Ridgway's rail	FE/CE/FP	Locally common yearlong in coastal wetlands and brackish areas around San Francisco Bay.	In saline emergent wetlands, nests mostly in lower zones, where cordgrass is abundant and tidal sloughs are nearby. Builds a platform concealed by a canopy of woven cordgrass stems or pickleweed and gumweed. Also uses dead drift vegetation as platform. In fresh or brackish water, builds nest in dense cattail or bulrush. Forages in higher marsh vegetation, along vegetation and mudflat interface, and along tidal creeks.	All year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Riparia riparia</i> bank swallow	--/CT/--	About 50-60 colonies remain along the middle Sacramento River and 15-25 colonies occur along lower Feather River where the rivers meanders still in a mostly natural state. Other colonies persist along the central coast from Monterey to San Mateo counties, and northeastern California in Shasta, Siskiyou, Lassen, Plumas, and Modoc counties.	Colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	All year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Sternula antillarum browni</i> California least tern	FE/CE/FP	Found along the Pacific Coast of California, from San Francisco southward to Baja California.	Nest in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action.	All year	<b>No.</b> Suitable habitat for this species not present on site.

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Strix occidentalis caurina</i> northern spotted owl	FT/CT; CSC/--	Geographic range extends from British Columbia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada. Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2,300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).	Year-round	<b>No.</b> Suitable habitat for this species not present on site.
Mammals					
<i>Antrozous pallidus</i> pallid bat	--/CSC/--	Locally common species at low elevations. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern counties, and the northwestern corner of the state from Del Norte and western Siskiyou counties to northern Mendocino county.	Habitats occupied include grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests, generally below 2,000 meters. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, under exfoliating bark, and under bridges.	Year-round	<b>Yes.</b> Suitable habitat for this species present on site.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	--/CSC/--	Known to occur throughout California, excluding subalpine and alpine habitats. Its range extends through Mexico to British Columbia and the Rocky Mountain states. Also occurs in several regions of the central Appalachians.	Requires caves, mines, tunnels, buildings, or other cave analog structures such as hallowed out redwoods for roosting. Hibernation sites must be cold, but above freezing.	Year-round	<b>No.</b> Suitable habitat for this species not present on site.



SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /CNPS LIST	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
<i>Reithrodontomys raviventris</i> salt marsh harvest mouse	FE/CE/FP	Only found in the saline emergent wetlands of San Francisco Bay and its tributaries.	Critically dependent on dense cover and their preferred habitat is pickleweed ( <i>Salicornia virginica</i> ). Seldom found in cordgrass or alkali bulrush. In marshes with an upper zone of peripheral halophytes (salt-tolerant plants), mice use this vegetation to escape the higher tides, and may even spend a considerable portion of their lives there. Mice also move into the adjoining grasslands during the highest winter tides.	All Year	<b>No.</b> Suitable habitat for this species not present on site.
<i>Taxidea taxus</i> American badger	--/CSC/--	Found throughout most of California in suitable habitat.	Suitable habitat occurs in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas.	All Year	<b>No.</b> Suitable habitat for this species not present on site.

SOURCE: Appendix A

#### STATUS CODES:

FEDERAL: United States Fish and Wildlife Service

FE Federally Endangered

FT Federally Threatened

FC Candidate for Federal Listing

STATE: California Department of Fish and Game

CE California Listed Endangered

CT California Listed Threatened

CSC California Species of Special Concern

CCE California Candidate for State Endangered Listing

CCT California Candidate for State Threatened Listing

CR California Rare

3 Plants About Which We Need More Information – A Review List

4 Plants of Limited Distribution – A Watch List

CNPS Threat Ranks:

0.1 Seriously Threatened in California (Over 80% of occurrences threatened/high degree and immediacy of threat)

0.2 Fairly Threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)

0.3 Not Very Threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

CNPS: California Native Plant Society (California Rare Plant Rank [CRPR])

1A Plants Presumed Extinct in California

1B Plants Rare, Threatened, or Endangered in California and Elsewhere

2B Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

***Congested-headed hayfield tarplant (Hemizonia congesta ssp. Congesta)***

Federal Status- None

State Status- None

Other- CNPS 1B.2

Congested-headed hayfield tarplant is an annual herb in the Asteraceae family. It occurs in valley and foothill grasslands and sometimes along roadsides, at elevations of 30 to 1060 meters. The species blooms from April through November. Its range extends through Mendocino, Marin, San Francisco, San Mateo, and Sonoma counties. The agricultural habitat between Adobe Creek and the warehouse or the small patches of vegetation within the ruderal/disturbed habitat may provide suitable habitat for this species. However, potential to occur is low due to regular vegetation management. Because this species can occur within roadsides and other disturbed areas, it cannot be excluded from analysis on the Project Site. Biological site surveys occurred during the bloom period for this species and did not observe any individuals.

***Pacific Grove clover (Trifolium polyodon)***

Federal – None

State – Rare

Other – CNPS List 1B.1

Pacific Grove clover is an annual herb documented predominantly along the central California coast. This species occurs predominantly in meadows or adjoining riparian habitat. It may also be found in meadows associated with coastal prairie or closed-cone pine forest. It is typically found in wetland habitats but can occur outside of wetlands. The nearest documented occurrence of this species to the Project Site is 1.2 miles away. This species may occur within the riparian corridor on the southeastern edge of the Project Site. Due to the regular disturbance around this habitat type and the presence of invasive vegetation within the riparian corridor, the likelihood of occurrence is low. Although regular disturbance does not occur within the riparian habitat, the surrounding upstream and downstream development and presence of invasive species has severely degraded the quality of this habitat. Biological site surveys occurred during the bloom period for this species and did not observe any individuals.

***Western bumble bee (Bombus occidentalis)***

Federal – None

State – Candidate Threatened

Other – None

The western bumble bee is a generalist forager that will visit and pollinate a variety of flowering plants. It is also a known pollinator of agricultural crop production plants. Their current range includes Alaska down through the westernmost part of Canada and throughout the western United States. The largest declines of this species are believed to occur within central California and western California, Oregon, and Washington. The western bumble bee is believed to be imperiled by invasive species and their foreign pathogens as well as climate change. The Project Site may be visited by western bumble bees, and flowering plants that may occur on site may serve as an attractant for this species.

### ***Steelhead (Oncorhynchus mykiss irideus) [Central California Coast DPS]***

Federal Status – Threatened

State Status – None

Other- None

Steelhead are the anadromous form of rainbow trout. As such, steelhead spawn in the freshwater streams in which they were born. Juveniles remain in the freshwater environment for one to two years prior to their out-migration into the ocean. Unlike other types of salmonoids, steelhead are capable of spawning multiple times throughout their life and do not typically die immediately after spawning. The steelhead in the Central California Coast ESU are a winter-run species. Winter-run steelhead typically migrate from November through April and spawn shortly after they arrive to their natal spawning habitat. Although steelhead in this ESU are classified as a winter-run species, hydro-modification has fundamentally changed the life history strategies of these fish over time. As cold waters persist at predictable flow patterns from dams on an annual basis, the occurrence of this species can be outside the November to April migratory window. This species has an average lifespan of six to seven years. The range includes portions of Alameda, Contra Costa, Marin, Mendocino, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties.

Adobe Creek, which runs through the southeastern portion of the property, is suitable habitat for this species. A Stream Assessment completed by CDFW determined that Adobe Creek along the Project Site presents suitable fish habitat for anadromous species (CDFW, 2008). This species has been observed in Adobe Creek as recorded in CNDDDB, and this creek is designated as Critical Habitat by NOAA under the Endangered Species Act. No fish passage barriers are known to occur from the Pacific Ocean to the Project Site.

### ***Foothill yellow-legged frog (Rana boylei)***

Federal Status – None

State Status – Candidate Threatened, Species of Special Concern

Other – None

Foothill yellow-legged frog (FYLF) is named for its abdomen and hind legs, which are distinctively yellowish in color. This species occurs in partially shaded, rocky streams at low to moderate elevations in areas of chaparral, cismontane woodland, and broadleaf upland forest habitats. Ideal habitat consists of open slow-moving perennial streams with rocky or bedrock substrates and small deeper pools. However, it can also occur in smaller perennial streams that have cobble size rocks and riffles. FYLF breeds from March through May in pools within perennial streams and attaches its eggs to gravel or rocks at the edges or along the banks. This species range includes most of northern California, west of the Cascades and south along the coast to the San Gabriel Mountains, and south along the western side of the Sierra Nevada Mountains and into Kern County.

Adobe Creek, which runs through the southeastern portion of the property, may represent suitable habitat for this species. A Stream Assessment completed by CDFW on Adobe Creek noted multiple observations of both FYLF and California red-legged frog within the vicinity of the Project Site (CDFW, 2008).



***California red-legged frog (Rana draytonii)***

Federal Status – Threatened

State Status – Species of Special Concern

Other- None

California red-legged frog (CRLF) requires a variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. Breeding sites occur in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, springs, sag ponds, dune ponds and lagoons. CRLF also breed in artificial impoundments including stock ponds. The breeding period is from November to March. During periods of wet weather, starting with the first rains of fall, some individuals may make overland excursions through upland habitats. Most of these overland movements occur at night. CRLF may move distances up to 1.6 kilometers throughout a wet season. CRLF rest and forage in riparian vegetation. Summer habitats include spaces under boulders or rocks and organic debris, such as downed trees or logs; industrial debris; and agricultural features, such as drains, watering troughs, abandoned sheds, or hay-ricks. CRLF requires 11 to 30 weeks of permanent water for larval development.

Adobe Creek, which runs through the southeastern portion of the property, may represent suitable habitat for this species. A Stream Assessment completed by CDFW on Adobe Creek noted multiple observations of both FYLF and California red-legged frog within the vicinity of the Project Site (CDFW, 2008).

***Western pond turtle (Emys marmorata)***

Federal Status – None

State Status – Species of Concern

Other- None

The western pond turtle is found in Pacific-slope drainages to an elevation of approximately 1450 meters. These turtles are found along ponds, marshes, rivers, streams, and irrigation ditches that typically have muddy or rocky bottom and grow aquatic vegetation. They require basking sites such as logs or mats of submerged vegetation. It prefers habitats with stable banks and open areas to bask in, as well as underwater cover provided by logs, large rocks, bulrushes, or other vegetation. This species generally leaves the aquatic site only to reproduce and to hibernate. Hibernation typically takes place from October or November to March or April. Egg-laying typically occurs in May and June, and may take place up to 0.5 kilometers from water.

The biological survey revealed that Adobe Creek along the Project Site may represent marginal western pond turtle habitat. The Project Site lacks suitable hibernation and nesting habitat, however this species has the potential to occur on site outside of breeding and hibernation. The nearest documented occurrence of this species is 0.7 miles away in the vicinity of Adobe Creek.

***Burrowing owl (Athene cunicularia)***

Federal Status – None

State Status – Species of Special Concern

Other – None

Burrowing owls are relatively small raptors that occur in a variety of upland habitats including open

grassland, prairie, plains, savannah, agricultural fields, and other ruderal areas such as vacant lots and wasteyards. This species is colonial and requires pre-existing burrows that have been abandoned by other animals (e.g., squirrel, fox, woodchuck) for roosting and nesting. Occupied burrows can be identified by a lining of feathers, pellets, and debris. Burrowing owls spend most of their time on the ground or on low-lying perches such as fence posts or dirt mounds. Most burrowing owls seek cover during the warmest part of the day, though they are capable of hunting during the day and night. The nesting season of this species extends from March through August and young fledge approximately two to four weeks after hatching. The range of this species includes the entire Central Valley to the Transverse Range, most of the Great Basin region, and most of the eastern and southern desert regions of Southern California.

Suitable, marginal foraging habitat for this species is present in the open grassy area on site. No burrows were observed on site suitable for nesting. There are no documented cases of this species within 5 miles of the Project Site.

### ***Swainson's hawk (Buteo swainsoni)***

Federal Status – None

State Status – Threatened

Other- None

Swainson's hawks arrive to their breeding grounds in the Central Valley in early March. They often nest peripherally to valley riparian systems as well as utilizing lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow trees, ranging in height from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. Breeding pairs construct nests composed of sticks, leaves, and bark. Eggs are laid from mid- to late-April and are incubated into mid-May when young begin to hatch. Young remain near the nest and depend on the adults for approximately four weeks after fledging until they permanently leave the breeding territory. Nesting occurs from March 1 to August 15. Swainson's hawks feed primarily on small mammals, birds, and insects. Young are fed rodents, rabbits, and reptiles. When not breeding, however, this hawk is atypical because it is almost exclusively insectivorous. Typical foraging habitat includes annual grasslands, alfalfa, and other dry farm crops that provide suitable habitat for small mammals. Suitable foraging habitat nearby nesting sites is critical for fledgling success.

Marginally suitable foraging habitat for this species is present in the open grassy area on site. Given high levels of disturbance it is unlikely that nesting would occur in the area. A single known documented occurrence of this species has been reported within 5 miles of the Project Site.

### ***Pallid bat (Antrozous pallidus)***

Federal – None

State – Species of Concern (CSC)

Other - None

The pallid bat is a medium-sized bat with large wide ears that are clearly separated at the base. This species occurs in a wide variety of habitats including grasslands, shrublands and chaparrals, woodlands, and forests. It is most abundant in open dry habitats that have abundant rocky areas for roosting. It forages over open ground and is mostly a nocturnal hunter. Pallid bat (like most bat species) is most

active during the dawn and dusk hours. This species will establish daytime roosts in caves, crevices, mines, large hollow trees, and unoccupied buildings. Pallid bats mate during the months of October through February and most young are born from April through July. The range of pallid bat includes most of California with the exception of the high Sierra Nevada from Shasta to Kern counties and the northwestern-most corner of the state.

Pallid bats may roost in riparian trees present on site and forage over the open grassy area. Although habitat is marginal and individual trees were not evaluated for roost potential, three occurrences of this species have been documented within 5 miles of the Project Site. It is therefore considered to have the potential to occur on the Project Site. However, no trees will be removed as a result of the Proposed Project.

### ***Nesting Migratory Birds***

Migratory birds have the potential to nest on and around the Project Site. Trees within the riparian corridor and habitat within the open grassy area may provide suitable nesting habitat for migratory birds protected under the MBTA.

## **5.0 RESULTS AND RECCOMENDED MITIGATION MEASURES**

Results of analysis of the Proposed Project are discussed herein as they relate to biological resources on the Project Site. The level of impacts is discussed in **Section 5.1** and **Section 5.2**. Mitigating actions are recommended and described in **Section 5.3** to reduce impacts to those biological resources identified on the Project Site.

### **5.1 HABITAT TYPES**

Project impacts will occur almost exclusively in developed/disturbed and agricultural habitat, as described in **Figure 3**. This represents low quality habitat to plant and wildlife species and is not considered sensitive. No development will occur within the riparian corridor. The Proposed Project will not result in the removal of trees, and the outfall will be designed to avoid impacts to the driplines of any trees. **Mitigation Measures 1 and 2** would minimize impacts to sensitive habitats. There would be a less-than-significant impact with mitigation.

### ***Wildlife Corridors and Riparian Habitat***

The Project Site is enclosed by fencing along the riparian corridor and the housing development immediately to the southwest. This fencing restricts the movement of wildlife into the proposed development footprint of the project site from the natural wildlife corridor within the riparian habitat. Additionally, the Project Site is within a developed urban area with surrounding major roadways and housing. Adobe Creek represents the only habitat on the Project Site that may be used for unrestricted wildlife movement. The Proposed Project would not result in the modification of Adobe Creek or significant impacts to the riparian corridor. An approximate 50' setback around Adobe Creek will provide additional protection to the riparian vegetation. No impacts will occur to the southeast side of Adobe Creek, and the 50' setback will minimize impacts to the northwest riparian corridor. There would be a less-than-significant impact on wildlife movement.



The Proposed Project would not result in the removal of native riparian vegetation. Clearing of invasive Himalayan blackberry would occur in order to increase the value of riparian habitat. This work would not impact trees or their driplines, and would not occur within 50 feet of the ordinary high water mark (OHWM) of Adobe Creek. **Mitigation Measure 2** would ensure stabilization of disturbed ground within the riparian habitat by removing Himalayan blackberry and replanting with native vegetation, thus increasing the habitat value. With mitigation incorporated, impacts would be less-than-significant.

### ***Wetlands and Waters of the U.S. or State***

Adobe Creek is a potential Water of the U.S. subject to USACE and RWQCB jurisdiction. Impacts to Adobe Creek would require the appropriate consultation, permits, and approvals prior to construction. The Proposed Project does not involve direct impacts to Adobe Creek. There will be no construction within Adobe Creek or within an approximate 50' buffer of the Ordinary High Water Mark. No other aquatic features were observed on the Project Site. There would be a less-than-significant impact to wetlands or other waters.

## **5.2 SPECIAL-STATUS SPECIES**

Preliminary data review and special-status species searches list 17 special-status plant species and 26 special-status animal species with the potential to occur in the region of the Project Area (**Attachment A** and **Table 1**). Of those regionally occurring special-status species, the Project Site contains suitable habitat to potentially support two special-status plant species and eight special-status animal species (**Table 1** and **Section 4.2**). The site additionally provides suitable nesting habitat for nesting migratory birds. No special-status species were observed during the site visit, which occurred during the bloom period of the two special-status plants with the potential to occur on site.

Bloom periods of special-status plants, shown in **Table 1**, are based off biologically-accepted timeframes for the most common bloom period provided by CNPS. There were no unusual environmental circumstances surrounding the 2019 bloom season in the vicinity of the project site that would suggest that these populations would bloom outside of the commonly-accepted bloom season for these species. Biological surveys completed for the Proposed Project in 2019 were timed to coincide with the identification period for special-status plants with the potential to occur on the project site. Due to the high levels of disturbance on the project site, potential for occurrence of these regionally occurring special-status plants is low.

Impacts to steelhead are reduced through **Mitigation Measures 1 and 2**. **Mitigation Measure 3** is recommended to reduce impacts to special-status plants. While no direct work is anticipated within Adobe Creek or the riparian buffer, **Mitigation Measure 4** is recommended to reduce impacts to FYLF, CRLF, and WPT. **Mitigation Measure 5** is recommended to reduce impacts to special-status birds, including those protected under the MBTA. While direct impacts to potential bat roosts are minimized by an absence of disturbance within the riparian buffer, disturbance from construction activities may still impact special-status bats. Therefore, **Mitigation Measure 6** is recommended to minimize impacts to special-status bats. There would be a less-than-significant impact to special-status species with the incorporation of **Mitigation Measures 1** through **6**.

### 5.3 RECOMMENDED MITIGATION MEASURES

The following recommended Mitigation Measures would reduce impacts to biological resources as a result of the Proposed Project.

#### ***Mitigation Measure 1 – Protection of Adobe Creek***

A 50-foot setback shall be applied to Adobe Creek. Staging of vehicles and construction of equipment shall not occur within this buffer area as much as possible. Silt fencing shall be installed along the outer edge of the riparian setback, and shall remain during site grading and groundwork for the Proposed Project. Any impacts to this 50-foot setback will be minimized and will not involve any removal of native woody vegetation.

#### ***Mitigation Measure 2 – Mitigation of Impacts to Riparian Habitat***

Disturbance related to creation of a water discharge channel from the stormwater basin shall not adversely impact the woody native vegetation within riparian habitat. In order to increase the quality of riparian habitat, non-native Himalayan blackberry shall be removed by hand along the edge of the riparian corridor. Bare ground in areas cleared of invasive vegetation shall be replanted with native vegetation. Following construction of the proposed project, control of Himalayan blackberry should occur through hand-clearing annually for three years to preserve high quality riparian habitat and prevent the spread of noxious species.

#### ***Mitigation Measure 3 – Special-status Plant Surveys***

Prior to ground disturbance, appropriately timed rare plant bloom surveys shall be conducted on the Project Site by a qualified biologist to identify any special-status plant species that may occur within the Project Site. The survey shall occur within the identification period of those special-status plants with the potential to occur on the project site, as described in **Table 1**, and shall occur yearly while the proposed project is in the planning stages. Results of the survey shall be documented in a memorandum and provided to the City of Petaluma. Should special-status plants be observed on site, a 25' no-disturbance buffer shall be installed around the population with high visibility fencing. If the plant is observed within the development footprint, consultation with USFWS and/or CDFW may be required to determine appropriate mitigating actions.

#### ***Mitigation Measure 4 – FYLF, CRLF, and WPT***

A qualified biologist shall conduct a pre-construction survey for FYLF, CRLF, and WPT no more than 5 days prior to ground disturbance. Results of the survey shall be documented in a memorandum and provided to the City of Petaluma. Exclusionary fencing shall be installed to exclude these species from areas of ground disturbance. This exclusionary fencing may be satisfied through required best management practices (BMPs) protecting Adobe Creek from stormwater-related pollution, such as property installed silt fencing, provided that these BMPs effectively exclude FYLF, CRLF, and WPT. The qualified biologist shall be on site during installation of the exclusionary fencing to ensure these species do not become entrapped within the area of disturbance.

A qualified biologist shall conduct an Environmental Awareness Training for FYLF, CRLF, and WPT to construction personnel involved in initial site disturbance. The training shall include the presentation

and distribution of materials that cover, at a minimum, habitat requirements, life history, and actions to be taken if observed on site of each species. Proof of this training shall be kept on the Project Site.

***Mitigation Measure 5 – Special-status and Nesting Birds***

Should work begin during nesting season (February 15 to September 15), a preconstruction nesting bird survey shall be conducted by a qualified biologist no more than 14 days prior to the start of ground disturbing activities. Areas within 500 feet of construction shall be surveyed for active nests as possible. Should an active nest be identified, a “disturbance-free” buffer will be established based on the needs of the species identified and will be maintained until it can be verified by a qualified biologist that the nestlings have fledged or the nest has failed. Should construction activities cease for 14 consecutive days or more within the nesting season, an additional nesting bird survey will be required before additional ground-disturbing activities may resume. Survey results shall be documented in a memorandum and shall be provided to the City of Petaluma.

***Mitigation Measure 6 – Special-status Bats***

A qualified biologist shall conduct a preconstruction survey for habitat appropriate to support pallid bats no more than 14 days prior to initiation of ground disturbance. Survey results shall be documented in a memorandum and provided to the City of Petaluma. Ground disturbance within 50 feet of areas identified as pallid bat habitat shall be restricted to between August 31 and October 15, or between March 1 and April 15 to avoid hibernation and rearing periods. Because no trees will be removed as a result of the Proposed Project, no removal of potential suitable bat roost trees will occur. Abandoned structures scheduled for demolition shall be included within the preconstruction survey. If bats, or evidence of bat roosting, is observed within these structures, CDFW shall be notified and an appropriate exclusionary method shall be put in place prior to impacts. Exclusion may occur through features such as one-way exits from roost habitat and shall be facilitated by a qualified biologist, and shall not occur outside of the date ranges listed above to avoid exclusion of habitat during hibernation or rearing.

## 6.0 REFERENCES

- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, and T.J. Rosatti, Eds, 2012. The Jepson Manual: Vascular Plants of California, 2nd edition. University of California Press, Berkeley, CA.
- CDFW 2008, Petaluma River Watershed Stream Habitat Assessment Reports: Adobe Creek.
- CDFW, 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. March 20, 2018. State of California Natural Resources Agency Department of Fish and Wildlife. Available online at: <https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281280-plants>.
- California Department of Fish and Wildlife (CDFW). 2019. California Natural Diversity Database: RareFind 5, Version 5.2.14. Available online at: <https://www.wildlife.ca.gov/Data/CNDDDB>. Accessed September 2019.
- CNPS, 2001. CNPS Botanical Survey Guidelines. Available online at: <https://www.cnps.org/plant-science/field-protocols-guidelines>.
- California Native Plant Society (CNPS). 2019. Inventory of Rare and Endangered Plants. Available online at: <http://rareplants.cnps.org/advanced.html>\_ Accessed September 2019.
- National Marine Fisheries Service (NMFS), 2019. Essential Fish Habitat Mapper – Pacific Region. Available online at: <https://www.habitat.noaa.gov/protection/efh/efhmapper/>. Accessed on September 2019
- NRCS, 2019. Custom Soil Resource Report for Napa County, California. Casa Grande Site. Available online at: <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed September 2019.
- U.S. Climate Data, 2019. City of Petaluma. Available online at: <https://www.usclimatedata.com/climate-petaluma/california/united-states/usca0854>
- USFWS, 2019a. Official Species List for Casa Grande Site. Sacramento Fish and Wildlife Office. Available online at: <https://ecos.fws.gov/ipac/>. Accessed September 2019.
- USFWS, 2019b. National Wetlands Inventory Wetlands Mapper for Casa Grande Site. Available online at: <https://www.fws.gov/wetlands/data/Mapper.html>. Accessed September 2019.
- USFWS, 2019c. Critical Habitat for Threatened and Endangered Species [USFWS]. Available online at: <https://fws.maps.arcgis.com/home/webmap/viewer.html>\_ Accessed September 2019.



# ***ATTACHMENT A***

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***PRELIMINARY RESEARCH DATA***



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

September 12, 2019

Consultation Code: 08ESMF00-2019-SLI-3014

Event Code: 08ESMF00-2019-E-09624

Project Name: Casa Grande Housing Development

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

#### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

[http://www.nwr.noaa.gov/protected\\_species/species\\_list/species\\_lists.html](http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html)

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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Attachment(s):

- Official Species List



## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Sacramento Fish And Wildlife Office**

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

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## Project Summary

Consultation Code: 08ESMF00-2019-SLI-3014

Event Code: 08ESMF00-2019-E-09624

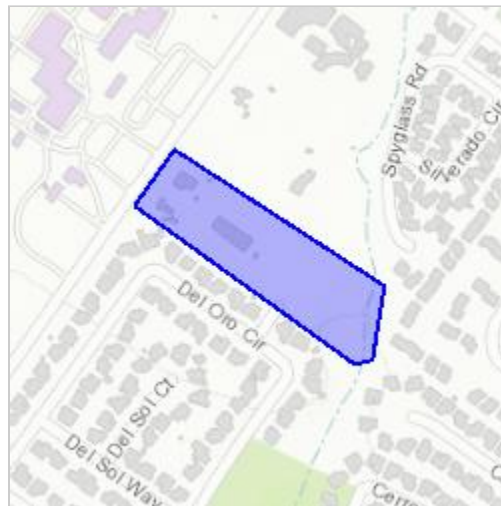
Project Name: Casa Grande Housing Development

Project Type: DEVELOPMENT

Project Description: Housing development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.240267849183155N122.59652748425027W>



Counties: Sonoma, CA

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## Endangered Species Act Species

There is a total of 15 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

NAME	STATUS
Salt Marsh Harvest Mouse <i>Reithrodontomys raviventris</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/613">https://ecos.fws.gov/ecp/species/613</a>	Endangered

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## Birds

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4240">https://ecos.fws.gov/ecp/species/4240</a>	Endangered
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/8104">https://ecos.fws.gov/ecp/species/8104</a>	Endangered
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/1123">https://ecos.fws.gov/ecp/species/1123</a>	Threatened
Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/8035">https://ecos.fws.gov/ecp/species/8035</a>	Threatened

## Reptiles

NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i> Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/6199">https://ecos.fws.gov/ecp/species/6199</a>	Threatened

## Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/2891">https://ecos.fws.gov/ecp/species/2891</a> Species survey guidelines: <a href="https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf">https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf</a>	Threatened

## Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a>	Threatened



## Insects

NAME	STATUS
<p>San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i></p> <p>There is <b>proposed</b> critical habitat for this species. The location of the critical habitat is not available.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/3394">https://ecos.fws.gov/ecp/species/3394</a></p>	Endangered

## Crustaceans

NAME	STATUS
<p>California Freshwater Shrimp <i>Syncaris pacifica</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/7903">https://ecos.fws.gov/ecp/species/7903</a></p>	Endangered

## Flowering Plants

NAME	STATUS
<p>Contra Costa Goldfields <i>Lasthenia conjugens</i></p> <p>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/7058">https://ecos.fws.gov/ecp/species/7058</a></p>	Endangered
<p>Marin Dwarf-flax <i>Hesperolinon congestum</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/5363">https://ecos.fws.gov/ecp/species/5363</a></p>	Threatened
<p>Soft Bird's-beak <i>Cordylanthus mollis ssp. mollis</i></p> <p>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/8541">https://ecos.fws.gov/ecp/species/8541</a></p>	Endangered
<p>Sonoma Spineflower <i>Chorizanthe valida</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/7698">https://ecos.fws.gov/ecp/species/7698</a></p>	Endangered
<p>Yellow Larkspur <i>Delphinium luteum</i></p> <p>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/3578">https://ecos.fws.gov/ecp/species/3578</a></p>	Endangered

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



# Selected Elements by Scientific Name

## California Department of Fish and Wildlife

### California Natural Diversity Database



Query Criteria: Quad<span style='color:Red'> IS </span>(Petaluma River (3812225))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b><i>Allium peninsulare</i> var. <i>franciscanum</i></b> Franciscan onion	PMLIL021R1	None	None	G5T2	S2	1B.2
<b><i>Ambystoma californiense</i></b> California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
<b><i>Amorpha californica</i> var. <i>napensis</i></b> Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
<b><i>Antrozous pallidus</i></b> pallid bat	AMACC10010	None	None	G5	S3	SSC
<b><i>Astragalus tener</i> var. <i>tener</i></b> alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
<b><i>Athene cunicularia</i></b> burrowing owl	ABNSB10010	None	None	G4	S3	SSC
<b><i>Bombus occidentalis</i></b> western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
<b><i>Buteo swainsoni</i></b> Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
<b><i>Calicina diminua</i></b> Marin blind harvestman	ILARAU8040	None	None	G1	S1	
<b><i>Chloropyron maritimum</i> ssp. <i>palustre</i></b> Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
<b><i>Chloropyron molle</i> ssp. <i>molle</i></b> soft salty bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1	1B.2
<b><i>Chorizanthe valida</i></b> Sonoma spineflower	PDPGN040V0	Endangered	Endangered	G1	S1	1B.1
<b><i>Coastal Brackish Marsh</i></b> Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
<b><i>Corynorhinus townsendii</i></b> Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
<b><i>Emys marmorata</i></b> western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
<b><i>Eriogonum luteolum</i> var. <i>caninum</i></b> Tiburon buckwheat	PDPGN083S1	None	None	G5T2	S2	1B.2
<b><i>Fritillaria liliacea</i></b> fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
<b><i>Geothlypis trichas sinuosa</i></b> saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
<b><i>Hemizonia congesta</i> ssp. <i>congesta</i></b> congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
<b><i>Hesperolinon congestum</i></b> Marin western flax	PDLIN01060	Threatened	Threatened	G1	S1	1B.1



Selected Elements by Scientific Name  
California Department of Fish and Wildlife  
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b><i>Lasthenia conjugens</i></b> Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
<b><i>Laterallus jamaicensis coturniculus</i></b> California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
<b><i>Lilium pardalinum ssp. pitkinense</i></b> Pitkin Marsh lily	PMLIL1A0H3	Endangered	Endangered	G5T1	S1	1B.1
<b><i>Melospiza melodia samuelis</i></b> San Pablo song sparrow	ABPBXA301W	None	None	G5T2	S2	SSC
<b><i>Navarretia leucocephala ssp. bakeri</i></b> Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
<b><i>Northern Coastal Salt Marsh</i></b> Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
<b><i>Oncorhynchus mykiss irideus pop. 8</i></b> steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
<b><i>Plagiobothrys mollis var. vestitus</i></b> Petaluma popcornflower	PDBOR0V0Q2	None	None	G4?TX	SX	1A
<b><i>Polygonum marinense</i></b> Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
<b><i>Rallus obsoletus obsoletus</i></b> California Ridgway's rail	ABNME05011	Endangered	Endangered	G5T1	S1	FP
<b><i>Rana boylei</i></b> foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
<b><i>Rana draytonii</i></b> California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
<b><i>Reithrodontomys raviventris</i></b> salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
<b><i>Riparia riparia</i></b> bank swallow	ABPAU08010	None	Threatened	G5	S2	
<b><i>Sidalcea calycosa ssp. rhizomata</i></b> Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
<b><i>Talanites ubicki</i></b> Ubick's gnaphosid spider	ILARA98030	None	None	G1	S1	
<b><i>Taricha rivularis</i></b> red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
<b><i>Taxidea taxus</i></b> American badger	AMAJF04010	None	None	G5	S3	SSC
<b><i>Trifolium polyodon</i></b> Pacific Grove clover	PDFAB402H0	None	Rare	G1	S1	1B.1
<b><i>Tryonia imitator</i></b> mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	

Record Count: 40

\*The database used to provide updates to the Online Inventory is under construction. [View updates and changes made since May 2019 here.](#)

## Plant List

17 matches found. *Click on scientific name for details*

### Search Criteria

Found in Quad 3812225

[Modify Search Criteria](#) [Export to Excel](#) [Modify Columns](#) [Modify Sort](#) [Display Photos](#)

Scientific Name	Common Name	CA Rare Plant Rank	Federal Listing Status	State Listing Status	Blooming Period	State Rank	Lifeform
<a href="#">Amorpha californica var. napensis</a>	Napa false indigo	1B.2			Apr-Jul	S2	perennial deciduous shrub
<a href="#">Astragalus tener var. tener</a>	alkali milk-vetch	1B.2			Mar-Jun	S1	annual herb
<a href="#">Chloropyron maritimum ssp. palustre</a>	Point Reyes bird's-beak	1B.2			Jun-Oct	S2	annual herb (hemiparasitic)
<a href="#">Chloropyron molle ssp. molle</a>	soft bird's-beak	1B.2	FE	CR	Jun-Nov	S1	annual herb (hemiparasitic)
<a href="#">Eleocharis parvula</a>	small spikerush	4.3			(Apr)Jun-Aug(Sep)	S3	perennial herb
<a href="#">Erigeron biolettii</a>	streamside daisy	3			Jun-Oct	S3?	perennial herb
<a href="#">Eriogonum luteolum var. caninum</a>	Tiburon buckwheat	1B.2			May-Sep	S2	annual herb
<a href="#">Fritillaria liliacea</a>	fragrant fritillary	1B.2			Feb-Apr	S2	perennial bulbiferous herb
<a href="#">Hemizonia congesta ssp. congesta</a>	congested-headed hayfield tarplant	1B.2			Apr-Nov	S2	annual herb
<a href="#">Hesperolinon congestum</a>	Marin western flax	1B.1	FT	CT	Apr-Jul	S1	annual herb
<a href="#">Lasthenia conjugens</a>	Contra Costa goldfields	1B.1	FE		Mar-Jun	S1	annual herb
<a href="#">Leptosiphon acicularis</a>	bristly leptosiphon	4.2			Apr-Jul	S4?	annual herb
<a href="#">Lessingia hololeuca</a>	woolly-headed lessingia	3			Jun-Oct	S2S3	annual herb
<a href="#">Micropus amphibolus</a>	Mt. Diablo cottonweed	3.2			Mar-May	S3S4	annual herb
<a href="#">Navarretia leucocephala ssp. bakeri</a>	Baker's navarretia	1B.1			Apr-Jul	S2	annual herb
<a href="#">Polygonum marinense</a>	Marin knotweed	3.1			(Apr)May-	S2	annual herb



<a href="#"><u>Ranunculus lobbii</u></a>	Lobb's aquatic buttercup	4.2	Aug(Oct)	Feb-May	S3	annual herb (aquatic)
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### Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 12 September 2019].

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[California Natural Diversity Database](#)

[The Jepson Flora Project](#)

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[CalPhotos](#)

### Questions and Comments

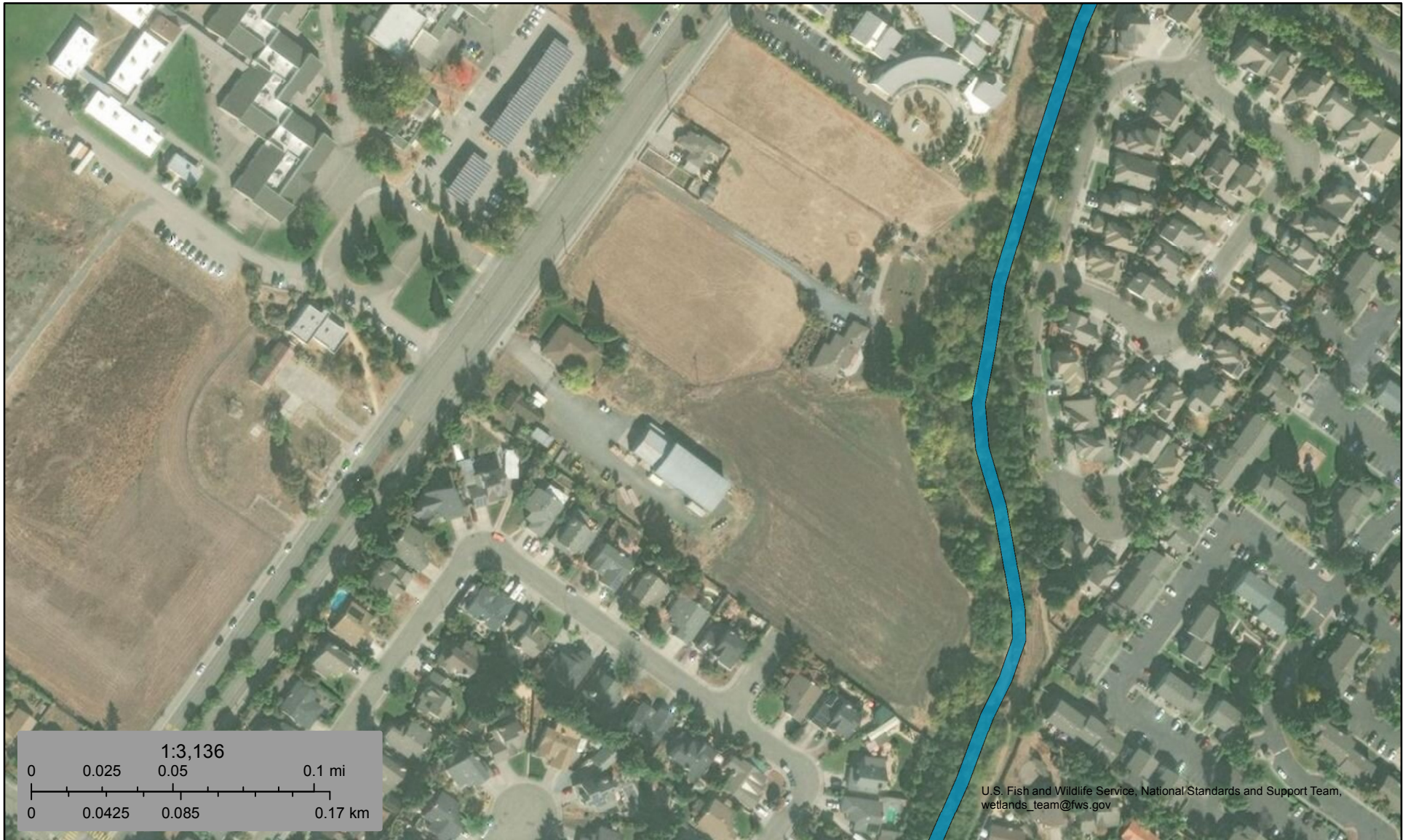
[rareplants@cnps.org](mailto:rareplants@cnps.org)



U.S. Fish and Wildlife Service

# National Wetlands Inventory

## Casa Grande



September 12, 2019

### Wetlands

	Estuarine and Marine Deepwater		Freshwater Emergent Wetland		Lake
	Estuarine and Marine Wetland		Freshwater Forested/Shrub Wetland		Other
			Freshwater Pond		Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

# ***ATTACHMENT B***

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***NRCS SOIL REPORT***





United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for **Sonoma County, California**



September 12, 2019

# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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























The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



# Custom Soil Resource Report Soil Map



MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
<b>Soils</b>			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
<b>Special Point Features</b>		<b>Water Features</b>	
	Blowout		Streams and Canals
	Borrow Pit	<b>Transportation</b>	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow		<b>Background</b>
	Marsh or swamp		Aerial Photography
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California  
Survey Area Data: Version 12, Sep 13, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 16, 2019—Apr 9, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeA	Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14	5.2	100.0%
<b>Totals for Area of Interest</b>		<b>5.2</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

## Custom Soil Resource Report

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Sonoma County, California

### **CeA—Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14**

#### **Map Unit Setting**

*National map unit symbol:* 2vbsl

*Elevation:* 20 to 360 feet

*Mean annual precipitation:* 26 to 42 inches

*Mean annual air temperature:* 57 to 61 degrees F

*Frost-free period:* 225 to 300 days

*Farmland classification:* Prime farmland if irrigated and drained

#### **Map Unit Composition**

*Clear lake, drained, sandy substratum, and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Clear Lake, Drained, Sandy Substratum**

##### **Setting**

*Landform:* Basin floors

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock

##### **Typical profile**

*Apg1 - 0 to 2 inches:* clay

*Apg2 - 2 to 8 inches:* clay

*Assg - 8 to 25 inches:* clay

*Bssg1 - 25 to 39 inches:* clay

*Bssg2 - 39 to 46 inches:* clay

*Bkssg - 46 to 52 inches:* clay

*2Bkg - 52 to 60 inches:* clay loam

*2Btg - 60 to 72 inches:* fine sandy loam

*2C - 72 to 84 inches:* loamy coarse sand

##### **Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Poorly drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 36 to 60 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Calcium carbonate, maximum in profile:* 6 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.5 to 3.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 8.0

*Available water storage in profile:* High (about 9.2 inches)

**Interpretive groups**

*Land capability classification (irrigated): 2e*

*Land capability classification (nonirrigated): 3e*

*Hydrologic Soil Group: D*

*Hydric soil rating: Yes*

**Minor Components**

**Haire**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*

**Reyes**

*Percent of map unit: 5 percent*

*Landform: Salt marshes*

*Hydric soil rating: Yes*

**Whight**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*



# References

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- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelpdb1043084>

## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)