



DRAFT BIOLOGICAL RESOURCES ASSESSMENT

FALCON POINT ASSOCIATES, LLC

CREEKWOOD HOUSING DEVELOPMENT PROJECT

MAY 2024

PREPARED FOR:

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This BRA has been updated to include information from an additional Aquatic Resource Delineation (ARD) report from Bargas Environmental Consulting, dated April 19, 2024 (**Appendix F**). Recent changes in hydrologic conditions have occurred within the project site since the development of the adjacent parcel. The updated delineation report includes the results of an additional survey conducted by Bargas Consulting in March 2024 to capture the recent changes.

1.0 INTRODUCTION

This Biological Resources Assessment (BRA) analyzes potential biological resource-related impacts associated with the proposed Creekwood Housing Development Project (Proposed Project). The Proposed Project consists of two parcels that total 5.20 acres located at 270 and 280 Casa Grande Road, City of Petaluma, California. The property is identified by Assessor's Parcel Numbers (APN) 017-040-016 and 017-040-051. The location of the Project Site is shown on Figures 1 and 2 in **Appendix A**. The Proposed Project would include demolition of the on-site residence at 280 Casa Grande Road, retention of the existing residence at 270 Casa Grande Road, and development of 59 dwelling units. In addition, the Proposed Project would also include construction of various on-site road and utility improvements, landscaping, and a new off-site public multi-use pathway and bridge connection over Adobe Creek within a property owned by the City of Petaluma that abuts the eastern boundary of these two parcels. For purposes of this BRA, the Project Site encompasses approximately 6.87 acres which includes the two parcels and portions of the City owned property (Project Site). Montrose Environmental (Montrose), formerly Analytical Environmental Services (AES), conducted biological field studies of the Project Site to document potentially occurring sensitive biological resources. Survey methodologies and results, impact minimization efforts and recommended mitigation measures are presented herein.

1.1 PROJECT LOCATION

The Project Site is located in the City of Petaluma (Figure 3 of **Appendix A**), bordered by Casa Grande Road to the west, Adobe Creek to the east, housing development to the south, and a retirement assisted living center to the north (Figure 2 of **Appendix A**). 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 a north-south direction approximately 1.3-miles west of the Project Site. Local access is provided by Casa Grande Road, a four-lane road that runs along the western boundary of the Project Site. The Project Site is relatively flat with an average elevation of 47-feet above mean sea level (msl).

1.2 PROJECT DESCRIPTION

A site plan for the Proposed Project is included as Figure 3 of **Appendix A**. The Project Site is currently in residential and agricultural use with one house, existing pasture fields and an additional house with multiple sheds east of the Proposed Project that will remain after construction. The Proposed Project involves the removal of existing onsite structures, including agricultural equipment. The Proposed Project includes construction of 59 dwelling units (duplex and triplex) and a looped private access drive aisle connection to Casa Grande Road. A multi-use pathway and bridge will connect the Proposed Project with an existing offsite public path along Spyglass Road on the east side of the Adobe Creek. Stormwater facilities, which include two stormwater bioretention basins and outfalls will be constructed adjacent to the Adobe Creek in the northeastern and southeastern portions of the Project Site. The stormwater facilities will be constructed outside of potential wetland features (Figure 3 of **Appendix A**).

2.0 REGULATORY SETTING

2.1 FEDERAL

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries and National Marine Fisheries Service (NMFS) are responsible to ensure compliance with 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 authorized. The USFWS also designates species of concern that receive attention from federal agencies during environmental review, although they are not otherwise protected under the FESA. Project-related impacts to such species would be considered significant and require mitigation.

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 or NOAA NMFS to be important for the recovery of the species. Under FESA, critical habitat loss is considered an impact to the species.

Essential Fish Habitat

Under the Magnuson-Stevens Act, Essential Fish Habitat (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 the NMFS. Adverse impacts include 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), and 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, or the California Regional Water Quality Control Board (RWQCB). The agencies also administer the National Pollutant Discharge Elimination System general permits for construction activities disturbing one acre or more.

2.2 STATE AND LOCAL

California Endangered Species Act (CESA)

The California Department of Fish and Wildlife (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 the 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 Site 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.

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 Environmental Quality Act Guidelines Title 14

The California Environmental Quality Act (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 from development projects. Title 14 also identifies those agencies that have jurisdiction over specific project types or impacts and provides authority to these agencies to approve mitigation for impacts subject to their jurisdiction. This also includes the allowance for agency protection of species not formally listed under FESA or CESA, but which still may be considered rare, threatened, or endangered.

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) maintains lists 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. The CNPS inventories 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 are rare or endangered in California and elsewhere, and CRPR 2A plants are 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 development 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

Projects within the City of Petaluma require the protection of specific species as outlined in the City of Petaluma Tree Preservation Ordinance (Chapter 17 IZO). This ordinance protects native trees, predominantly oak species, as well as significant groves or stands, or trees located in riparian corridors.

3.0 METHODOLOGY

3.1 PRELIMINARY DATA REVIEW

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

- USFWS list of special-status species with the potential to occur on and near the Project Site (USFWS, 2023a, **Appendix B**);
- Critical Habitat Mapper (USFWS, 2023b, **Appendix B**);
- NOAA Fisheries Critical Habitat Mapper (NOAA 2023a, **Appendix B**);
- NOAA Fisheries/NMFS Essential Fish Habitat Mapper (NOAA 2023a, **Appendix B**);
- California Natural Diversity Database (CNDDDB) query of special-status species with the potential to occur within a 5-mile radius of the Proposed Project site (CDFW, 2023, **Appendix B**);
- CNPS query of special-status species known to occur in the Petaluma River, Petaluma, Sears Point, San Geronimo, Novato, Cotati, Sonoma, Petaluma Point, and Glen Ellen 7.5' minute United States Geological Survey (USGS) topographical quads (CNPS, 2023a, **Appendix B**);
- USFWS National Wetland Inventory mapper for the Project Site (USFWS, 2023c, **Appendix B**);
- California Aquatic Resources Inventory (SFEI 2023, **Attachment B**);
- Custom Soil Resource Report of the Project Site from the U.S. Department of Agriculture and Natural Resources Conservation Service (NRCS) (NRCS, 2020, **Appendix B**);
- City of Petaluma General Plan Figure 3.8-1: Habitat Areas and Special Status Species (City of Petaluma, 2008, **Appendix B**);
- Google Earth satellite imagery (Google Earth 2023);
- Historical aerial photography of the Project Site and surrounding area (EDR, 2021);
- Aquatic Resource Delineation Creekwood Housing Development Project, Petaluma, Sonoma County, California (Bargas, 2024, **Appendix F**).

3.2 SURVEY TECHNIQUES

Montrose biologists conducted biological resources surveys of the Project Site on April 15, June 15, July 31, 2020, April 29, 2022, May 17, 2023. An additional survey by biologists from Bargas Environmental Consulting (Bargas) was conducted on March 5, 2024. Surveys were conducted by walking meandering transects throughout and around the Project Site. Data from Montrose was collected via a Trimble Geo XH, hand-held GPS receiver. Data from Bargas was collected via an Arrow EOS GPS unit and the FieldMaps application. Survey goals consisted of identifying habitat types, sensitive habitats, 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 to be communities of limited distribution, or are considered waters of the U.S. or State by regulatory agencies.

Habitat requirements of special-status species were compared to habitats present on and adjacent to the Project Site based on survey observations, desktop research data, and aerial photographs. Wildlife species were 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. Refer to **Appendices B, C, D, and F** for field survey details.

Plant 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). Refer to **Appendices B, C, D, and F** for field survey details.

In addition to Project Site field surveys, satellite and aerial photographs were also reviewed to assess habitats surrounding the Project Site for potential wildlife movement or wildlife corridors (Google Earth 2023). Field methodology for identifying corridors for movement included searching for game trails or habitat that would favor movement of wildlife or potential gene flow. Potential barriers were also reviewed to determine if 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 Area. Coastal ranges surround generally run from north to south and border Petaluma on the east and west. The climate of the region is heavily influenced by the proximity to the coastline. Annual rainfall averages 26.7-inches per year, and annual temperatures range from and an average high of 82 degrees Fahrenheit (°F) in August to an average low of 57 °F in January (U.S. Climate Data, 2020).

The Project Site consists primarily of agricultural fields planted with mixed grasses and forbs as forage crops for sheep grazing. In addition, the subject property includes two residences, a gravel driveway off Casa Grande Road that extends to the residence at 270 Casa Grande Road, associated outbuildings, and ornamental and garden vegetation. Adobe Creek and its associated riparian corridor is located along the eastern boundary of the Project Site. The Creek flows within the riparian corridor downstream, where it then confluences with the Petaluma River. Three seasonal wetlands exist in the southwestern portion of the Project Site and persist throughout the wet season. (**Appendix F**, Bargas, 2024).

A custom NRCS soil assessment was prepared for the Project Site (**Appendix B**, NRCS, 2020). The assessment maps soil units and provides a summary of the characteristics of each unit. The Project Site 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 Project Site consists primarily of agricultural fields either planted with or grazed for pasture, developed/disturbed habitat including residences and garden areas, and a riparian corridor on both sides of Adobe Creek located at the eastern border of the Project Site (Figure 4 of **Appendix A**). Site photographs are included as Figure 5 of **Appendix A**. Habitat types identified on the Project Site are further discussed below. A list of vascular plant species observed within the Study Area is included as **Appendix D**.

Developed/Disturbed

A total of approximately 1.29 acres of the Project Site are classified as developed/disturbed, as shown in Figure 4 of **Appendix A**. Two residences are located within the Project Site. A gravel driveway off Casa

Grande Road provides access to the existing residence on the east side of the Project Site along with multiple outbuildings. An additional residence is located at the entrance to the Project Site along Casa Grande Road. A large portion of the area surrounding the outbuildings and houses is characterized by bare ground with compressed gravel for vehicle driving and parking. Areas that are not graveled are planted with ornamental and plant 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 and 2 in **Figure 5 of Appendix A**.

Annual Grassland

Approximately 4.15 acres of annual grassland habitat occurs within the Project Site. The annual grasslands fall under the classification of *Avena spp. – Bromus spp.* Herbaceous Semi-Natural Alliance (CNPS 2023b). This area, shown in **Figure 4**, had been disked and planted with mixed non-native grasses and forbs as forage crops for sheep grazing. Species observed in these fields include oats (*Avena spp.*), soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), field bindweed (*Convolvulus arvensis*), wall barley (*Hordeum murinum*), bristly ox-tongue (*Helminthotheca echioides*) common stork's-bill (*Erodium cicutarium*), and Italian ryegrass (*Festuca perennis*). Representative photos of this habitat can be seen in Photos 4, 5, and 6 of **Figure 5 of Appendix A**.

Riparian

A total of 1.12 acres of riparian habitat occurs along Adobe Creek located along the eastern boundary of the Project Site, as shown in **Figure 4 of Appendix A**. The riparian habitat is classified as *Salix lasiolepis Shrubland Alliance* (CNPS 2023b). This riparian corridor includes species such as Himalayan blackberry (*Rubus armeniacus*), coast live oak (*Quercus argifolia*), valley oak (*Quercus latifolia*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), California buckeye (*Aesculus californica*), big leaf maple (*Acer macrophyllum*), fennel (*Foeniculum vulgare*), and flat top sedge (*Cyperus eragrostis*) occur within this riparian corridor.

Seasonal Wetland

Within the annual grassland habitat, three separate seasonal wetlands (SW-1, SW-2, and SW-3) totaling 0.09 acres occur in the annual grassland on the southern portion of the Project Site as shown in **Figure 4 of Appendix A**. These wetlands include species such as clustered dock (*Rumex conglomeratus*), water pygmyweed (*Crassula aquatica*), hyssop loosestrife (*Lythrum cisopotholia*), and Italian ryegrass.

Riverine (Adobe Creek)

Adobe Creek drains the Sonoma Mountain Watershed and flows south to where it confluences with the Petaluma River, thence the San Pablo Bay, thence the San Francisco Bay and thence the Pacific Ocean. Adobe Creek is a second order stream and mapped as a blue line stream according to the USGS National Hydrography Dataset (NHD; USGS 2023). The USFWS National Wetlands Inventory map identified Adobe Creek as riverine habitat (USFWS, 2023c; **Appendix C**). Adobe Creek is a second order stream and mapped as a blue line stream according to the USGS National Hydrography Dataset (NHD; USGS 2023). The USFWS National Wetlands Inventory map identified Adobe Creek as riverine habitat (USFWS, 2023c; **Appendix C**). The creek displays a clear ordinary high water mark (OHWM), top of bank, and therefore is likely be considered a Water of the U.S. and State of California subject to USACE and RWQCB jurisdiction, respectively. Adobe Creek (as shown in **Figure 4** and Photo 3 of **Figure 5; Appendix A**).

Approximately 623 linear feet (0.22 acres) of the creek flow within the Project Site. The width of the creek averages 15 feet. The substrates vary from cobble to sand bars. The majority of the riverine habitat is covered by tree canopy with more openings in the canopy in the southern section. Adobe Creek was assessed by the CDFW and determined to provide suitable habitat for anadromous fishes

(CDFW, 2008). A representative photo of Adobe Creek is included in Photo 3 of **Figure 5 of Appendix A**.

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 review of special-status species database queries identified 64 special-status plant species and 25 special-status animal species with the potential to occur in the region of the Project Site (**Appendix B**). The name, regulatory status, distribution, habitat requirements, period of identification, and potential to occur on the Project Site for each special-status species are listed in the Regionally Occurring Special Status Species Table of **Appendix C**.

The Project Site contains suitable habitat to potentially support three special-status plant species and eight special-status animal species. 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. A follow up botanical survey was conducted during the 2022 blooming period for two special-status plants determined to have suitable habitat within the Study Area and therefore the possibility to occur (Montrose 2022; **Appendix G**). No special-status plants were observed during this focused botanical survey. Additional information about species with the potential to occur on the Project Site is discussed below.

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 counties. The agricultural habitat between Adobe Creek and existing development or the small patches of vegetation within the developed/disturbed habitat may provide suitable habitat for this species. However, the 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 surveys were conducted during the bloom period for this species and no individuals were observed.

Sanford's Arrowhead (*Sagittaria sanfordii*)

Federal Status - None

State Status - None

Other - CNPS 1B.2

Sanford's arrowhead is an emergent rhizomatous herb in the water-plantain family (*Alismataceae*). It is found in assorted shallow freshwater marshes and swamps, ditches, ponds, and slow-moving streams from 0 to 650-meters msl. The nearest record is approximately 14-miles south of the Project Site documented within Arroyo de San Jose growing in standing water or on low shelves adjacent to flowing water. Marginal habitat for this species can occur within riverine habitat during low flows or along the edge of riverine and riparian habitats where standing water may occur creating saturated conditions for prolonged periods. No Sanford's arrowhead plants were observed during surveys.

Pacific Grove Clover (*Trifolium polyodon*)

Federal Status - None

State Status - 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. Pacific Grove clover was not observed during focused botanical surveys conducted during the bloom period for this species in 2020 and 2021.

Western Bumble Bee (*Bombus occidentalis*)

Federal Status - None

State Status - Candidate Endangered

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 through the westernmost part of Canada and throughout the western United States. This species is found in open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Found at elevations from 0-2000+ meters msl. Nesting occurs underground in abandoned rodent burrows or other cavities. 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 (Xerces Society, 2019). Nearest known occurrence is from 1965 and is located approximately 1.3-miles west of the Project Site (CDFW 2023). No burrows suitable for Western bumble bee nesting habitat were observed during surveys. The Project site does contain suitable foraging habitat within the annual grassland or in openings in the riparian and riverine habitats.

Steelhead (*Oncorhynchus mykiss irideus*) [Central California Coast Distinct Population Segment (DPS)]

Federal Status - Threatened

State Status - None

Other - None

Steelhead are the anadromous form of rainbow trout, as such, steelhead spawn in 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 salmonids, 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 Evolutionarily Significant Unit (ESU) are a winter-run species that 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 Project Site. A Stream Assessment completed by CDFW determined that Adobe Creek along the eastern boundary of the Project Site presents suitable fish habitat for this anadromous species (CDFW, 2008). This species has been observed in Adobe Creek as recorded in CNDDDB. No fish passage barriers occur from the Pacific Ocean to the Project Site.

Foothill Yellow-legged Frog – North Coast DPS (*Rana boylei*, pop. 1)

Federal Status - None

State Status - Species of Special Concern

Other - None

The 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. The 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 into Kern County. The Project Site is located within the distribution of the north coast FYLF DPS, also referred to as Population 1. This DPS of FYLF is not currently listed as candidate T by the USFWS, but remains listed a Species of Special Concern (SCC), by CDFW. The riverine habitat of Adobe Creek, and adjacent uplands within the riparian habitat are suitable for this species. During a Stream Assessment completed by CDFW on Adobe Creek noted multiple observations of FYLF within the vicinity of the Project Site (CDFW, 2008). CNDDDB occurrences of FYLF have been recorded upstream and immediately downstream of the Project Site (CDFW 2023).

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. A Stream Assessment completed by CDFW on Adobe Creek noted observations of CRLF within the Adobe Creek watershed (CDFW, 2008). Those observations were approximately 6.5-miles upstream of the Project Site. The nearest occurrence of CRLF from the Project Site was recorded in 1994 approximately 1.5-miles southeast of the Project Site. Adobe Creek, which runs through the eastern portion of the Project Site, may provide suitable dispersal habitat for this species. Although some shallow ponding and slow pools may occur during periods of the year, the riverine habitat of Adobe Creek is not suitable breeding habitat.

Western (Northwestern) Pond Turtle (*Emys [Actinemys] marmorata*)

Federal Status - Federally Proposed Threatened

State Status - Species of Concern

Other - None

The western pond turtle (WPT) is found in Pacific-slope drainages up to an elevation of approximately 1450 meters. The CDFW recognizes the WPT as a single species. An alternative taxonomy of the WPT

splits the species into two species; the northwestern pond turtle (NWPT), and southwestern pond turtle (SWPT). The northwestern pond turtle subspecies is known to occur within Washington, Oregon, Nevada, and northern and central California. The USFWS recognizes the NWPT and SWPT as distinct species and have recently proposed listing both species in October 2023. For purposes of this report the WPT nomenclature will be used to refer to the NWPT as the same species.

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 the 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 nests can be constructed in suitable upland areas up to 0.5 kilometers from aquatic habitat. Eggs are laid in sandy to clay soils (Nussbaum et. al. 1983). The biological surveys recorded suitable habitat for western pond turtle along Adobe Creek. The Project Site contains suitable hibernation and nesting habitat and therefore WPT has the potential to occur on-site during those periods of the year. The nearest documented occurrence of this species is 0.7-miles downstream of the Project site in the vicinity of Adobe Creek.

Swainson's Hawk (*Buteo swainsoni*)

Federal Status - None

State Status - Threatened

Other- None

Swainson's hawks arrive at 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. When not breeding, 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 on-site open grassy area. Given the high levels of on-site 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 Status - None

State Status - 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

northwesternmost 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.

4.3 CRITICAL HABITAT

No USFWS-designated Critical Habitat occurs on the Project Site (USFWS, 2023b; **Appendix B**). CRLF Designated Critical Habitat is present approximately 3.4-miles northeast and 3.2miles southwest of the Project Site. NOAA Fisheries/NMFS-designated critical habitat for Steelhead – Central California Coast DPS is present within Adobe Creek (NOAA 2023a; **Appendix B**). The Project Site is also within NOAA Fisheries/NMFS designated Essential Fish Habitat (EFH) for Chinook and Coho salmon (NOAA 2023b, **Appendix B**)

5.0 RESULTS AND RECOMMENDED MITIGATION MEASURES

5.1 SENSITIVE HABITATS

The Proposed Project is designated within developed/disturbed and annual grassland habitats. These areas provide low-quality habitat to plant and wildlife species and are not considered sensitive. Impacts to these habitat types are 0.62 for developed/disturbed and 3.54 acres annual grassland habitats respectively. Seasonal wetland habitat (considered a sensitive resource) occurs within the annual grassland habitat and approximately 0.09 acre would be impacted by the Proposed Project. Table 1 includes a summary table showing permanent impacts by habitat type.

Table 1. Summary table of total and impacted habitat acres.

Habitat Type	Total Acres	Impacted Acres*
Annual Grassland	4.15	3.54
Developed/Disturbed	1.29	0.62
Riparian	1.12	0.07
Riverine	0.22	0.22
Seasonal Wetland	0.09	0.09
Total:	6.87	4.54
* See Figure 4 of Appendix A.		

The riverine and riparian habitat associated with Adobe Creek, are considered sensitive and are subject to Sections 1600-1616 of the California Fish and Game Code. In addition, trees within the riparian corridor are considered protected under the City of Petaluma Tree Ordinance. The pedestrian bridge and multi-use pathway will traverse through the riparian habitat and over the riverine habitat of Adobe Creek as shown in Sheet L-5 of the Tree Removal, Preservation & Replacement Plans (TPP), **Appendix E** (SJLA, 2023).

The bridge, multi-use pathway and stormwater bio-retention facility outfalls have been designed outside the OWHM of Adobe Creek channel and will not impact the sensitive riverine habitat. Implementation of **Mitigation Measure 1** would ensure a 50-foot setback from the ordinary high-water mark (OHWM) of Adobe Creek.

The Proposed Project was designed to minimize impacts within the dripline of trees within the riparian habitat. Riparian habitat impacts associated with the Proposed Project are approximately 0.07 acre (**Table 1**). In addition, vegetation removal with riparian habitat is necessary for placement of the free span bridge. The TPP provides an inventory of trees that will be preserved, pruned or removed within the Project Site. The TPP

details the species, diameter breast height (DBH), protected status, and depicts tree locations in relation to Proposed Project design (**Appendix E**).

Appropriate permits for the removal of trees would be obtained and replanting required by the removal of these trees will follow applicable guidelines pursuant to **Mitigation Measures 2 and 3**. Therefore, there would be a less-than-significant impact to protected trees with implementation of **Mitigation Measures 2 and 3**.

5.2 WETLANDS AND WATERS OF THE U.S. OR STATE

Impacts to Adobe Creek would require appropriate consultation, permits, and approvals prior to construction. Three shallow depressions with standing water were observed in the southern pasture adjacent to the eastern residence during the rainy season of 2023. These depressions are further described in the ARD (**Appendix F**, Bargas 2024). The USACE must make a determination regarding the jurisdiction of the seasonal wetland taking the recent Sackett vs. USEPA decision into consideration.

The Proposed Project involves the installation of a stormwater basin, outfall facilities and a multi-use bridge and pathway within the riparian habitat and above Adobe Creek. In addition, the installation of the pedestrian bridge will result in the removal of limited trees from the riparian habitat. With the implementation of **Mitigation Measure 1**, construction activities would be limited within 50-feet of the OHWM of Adobe Creek. Therefore, there would be a less-than-significant impact to wetlands and waters of the U.S./State with implementation of **Mitigation Measures 1, 2 and 3**.

5.3 SPECIAL-STATUS SPECIES

As described above, the Project Site contains suitable habitat to potentially support three special-status plant species and eight special-status animal species. No special-status plant species were observed during the surveys conducted during blooming periods in 2020 and 2021. Existing residential and agricultural land management practices and associated disturbance reduces the potential for occurrence of the special-status plants to a low level.

Impacts to potentially occurring steelhead in Adobe Creek would be reduced through implementation of **Mitigation Measures 1 and 5**. While no direct work will occur within the ordinary high water mark of Adobe Creek, minimal disturbance is anticipated within the riparian habitat. **Mitigation Measure 4** is recommended to reduce potential impacts to FYLF, CRLF, and WPT. Disturbance from construction activities within and adjacent to the riparian habitat may impact special-status bats. Therefore, **Mitigation Measure 6** is recommended to minimize impacts to special-status bats. Therefore, there would be a less-than-significant impact to special-status species with implementation of **Mitigation Measures 1 through 7**. As appropriate and noted in the mitigation measures, a qualified CDFW/USFWS-approved biologist will ensure that compliance with the following measures is maintained.

5.4 NESTING MIGRATORY BIRDS AND RAPTORS

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 MBTA-protected birds. **Mitigation Measure 7** is recommended to reduce impacts to nesting migratory birds. Therefore, there would be a less-than-significant impact to nesting migratory birds with implementation of **Mitigation Measure 7**.

5.5 WILDLIFE MOVEMENT

The Project Site is enclosed by fencing along the riparian corridor and the housing development

immediately to the southwest. The residential development on the east side of Adobe Creek also contains perimeter fencing. This fencing restricts the movement of wildlife onto the Project Site from the riparian habitat. Additionally, the Project Site is located within an existing developed urban area surrounded by major roadways and residential development. The Proposed Project would not result in the modification of Adobe Creek or significant impacts to the riparian corridor. An approximate 50-foot setback from Adobe Creek would be implemented to provide additional protection to riparian vegetation. No impacts would occur to the southeast side of Adobe Creek. Therefore, there would be a less-than-significant impact on wildlife movement.

5.6 RECOMMENDED MITIGATION MEASURES

In addition to **Mitigation Measures 1** -through **7**, subsequent permitting processes with resource agencies could result in more specific mitigation language beyond the measures identified in this BRA and those required by the City as part of the CEQA/City land use entitlement process. Refined avoidance and protection measures may be incorporated as part of agency permit authorizations.

Mitigation Measure 1 – Protection of Adobe Creek

BIO-1: To avoid construction impacts to Adobe Creek, the following shall be implemented:

1. A 50-foot setback from the OHWM of Adobe Creek shall be established prior to the start of grading activities except for construction of the stormwater outfall facilities and the off-site multi-use pathway and bridge where a lesser setback shall be established in consultation with a qualified biologist. Construction and staging of vehicles and equipment shall not occur within the creek channel. Silt fencing shall be installed along the outer edge of the disturbance footprint, and shall remain during grading activities. If disturbance to jurisdictional aquatic features is to occur as a result of the project, authorization from the USACE under Section 404 of the CWA and the RWQCB under Section 401 will be required. If disturbance is to occur within the OHWM of Adobe Creek, a formal delineation shall be submitted to the USACE before the application of permits to state and federal agencies is completed.

Mitigation Measure 2 – Protection of Riparian Habitat

BIO-2: To avoid construction impacts to riparian vegetation within the Project Site, the following shall be implemented:

1. A 50-foot setback from riparian vegetation shall be established prior to the start of grading activities except for construction of the stormwater outfall facilities and pedestrian bridge and the off-site multi-use pathway and bridge where a lesser setback shall be established in consultation with a qualified biologist. Construction and staging of vehicles and equipment shall not occur within 50-feet of riparian vegetation and shall be parked in designated staging areas only. Silt fencing shall be installed along the outer edge of the disturbance footprint and shall remain during grading activities.
2. Removal of native trees or riparian vegetation for the proposed pedestrian bridge, and pathway within riparian habitat will require a LSAA notification with CDFW.
3. Implementation of mitigation measures designed to protect trees are outlined in the TPP (**Appendix E**, Urban Forestry Associates, 2023), which includes, but not limited to, Tree Protection Zones (TPZ) and Non-intrusion Zones (NIZ).

Mitigation Measure 3 – Tree Removal Mitigation

BIO-3: In accordance with the City of Petaluma Tree Ordinance, all protected trees to be removed, as identified in the TPP by the certified arborist shall be replaced according to the ratios established in the TPP (**Appendix E**, Urban Forestry Associates, 2023).

Mitigation Measure 4 – FYLF, CRLE, and WPT

BIO-4: To avoid impacts during construction activities from habitat degradation and loss, disturbance and displacement, injury and mortality to special status species that may be present on-site or in the immediate vicinity including the foothill yellow-legged frog (FYLF) western pond turtle (WPT) and California red-legged frog (CRLF), the following shall be implemented:

1. A qualified CDFW/USFWS-approved biologist shall conduct pre-construction surveys of all ground disturbance areas within suitable habitats in and adjacent to the Project Site to determine if special status species are present prior to the start of construction activities including tree trimming and removal. Preconstruction surveys shall be completed no more than 5 days prior to the initiation of grading activities in habitats where special status species have the potential to occur (FYLF, WPT, and CRLF). If any special status species are found, the biologist shall contact the CDFW (and USFWS) to determine whether relocation and/or additional exclusion buffers are appropriate. If the CDFW approves relocating the animal, then the approved-biologist shall be given sufficient time to move the animal(s) from the work site before work construction activities begin.
2. If disturbance is to occur within the OHWM of Adobe Creek, a Section 404 permit from the USACE and Section 7 consultation with the USFWS and NOAA Fisheries/NMFS will be required for potential impacts to federally listed species.
3. Any vegetation removed prior to the start of construction activities shall be placed away from sensitive species exclusion areas so that no cut vegetation remains once exclusionary fencing is installed. All nonnative, invasive vegetation removed shall be discarded offsite and away from aquatic resources to prevent reseeding.
4. Prior to the start of construction activities, exclusionary fencing shall be installed along the work area boundary as determined by a qualified biologist. Exclusionary fencing will act as a barrier to keep special status species from entering the work area. An exclusionary fence plan, including the following components shall be prepared by a qualified biologist and approved by regulatory agencies:
 - a. Areas approved for grading and clearing shall be delineated with suitable fencing materials and dimensions (such as temporary high-visibility orange-colored fence or silt fence at least 4 feet in height, flagging, or other barriers and buried to a depth of at least 4 inches) to act as a barrier to keep special status species from entering the Project Site. Signs shall be posted that clearly state that construction personnel and equipment are excluded from the marked area. The fencing shall be inspected and approved by a qualified biologist and maintained daily until all construction activities are complete. The fencing shall be removed only when all construction equipment is no longer onsite. No construction activities shall take place outside the delineated project site.
 - b. To avoid attracting predators, food-related trash shall be kept in closed containers and removed daily from the exclusion zone.
 - c. At the end of each day, all construction-related holes or trenches deeper than 1-foot shall be covered to prevent entrapment of special status species.
 - d. Prior to the commencement of daily construction activities, all conduit and pipes shall be inspected for the presence of animals. Removal of any animals shall be done in consultation with the approved qualified biologist.
5. Prior to construction, a qualified biologist shall conduct an Environmental Awareness Training session to familiarize all construction personnel with identification of special status

- species and associated habitats, general provisions and protections afforded by the FESA/CESA , measures implemented to protect these species, actions to be taken if species are observed onsite, and a review of project site boundaries and jobsite maintenance protocols (i.e., worker-generated trash, worker vehicle and construction equipment parking and disposal of construction wastes). All personnel shall sign an affidavit acknowledging participation in the training and understanding species legal status, penalties for violations and all protective measures. A wallet-sized card or fact sheet handout shall be distributed to all crews onsite. Proof of this training for all on-site personnel shall be kept on the Project Site.
6. Grading activities shall cease one half hour before sunset and shall not commence prior to one half hour before sunrise.
 7. Grading activities shall be prohibited during rain events that meet the following: within 24-hours of events predicted to deliver more than 0.2 inches of rain and within 24-hours after rain events exceeding 0.2 inches in measurable precipitation.
 8. No grading shall occur after 0.5 inches of rain has occurred after November 1 in the year construction grading work is occurring unless a one-week extension based on fair weather is approved by regulatory agencies (City of Petaluma, CDFW and RWQCB).
 9. Prior to project occupancy, residents shall be advised that dogs are to be leashed at all times within development boundaries including within 50 feet of the southern, eastern, and western wetland habitat to ensure that sensitive resources and riparian habitat are preserved.
 10. Trash receptacles shall be secured within enclosures that exclude mesopredators (e.g., raccoons and coyotes) to avoid attracting and subsidizing these predators. Trash enclosures and receptacles onsite shall be routinely maintained.
 11. Following construction activities, results from any sensitive species surveys shall be documented in a memorandum and provided to the City of Petaluma within 60-days following the end of construction activities, or sooner, if requested by City staff.

Mitigation Measure 5 – Anadromous Fish

BIO-5: To avoid impacts during construction activities to anadromous fish, the following shall be implemented:

1. Construction within 50 feet of Adobe Creek, shall be conducted outside of the known salmonid winter and fall runs (known to occur from November to April for this region). By avoiding this window, impacts to migrating salmonids will be reduced as the majority of the salmonids will have completed their migration.
2. Standard erosion control measures will be implemented around the disturbance areas. These measures will be included in the final plan set approved by the City of Petaluma and will be implemented around the disturbance areas. A qualified biological monitor will be present during the installation of BMPs ensure no special status species wildlife are harmed during installation or become entrapped within the disturbance area.

Mitigation Measure 6 – Special-status Bats

BIO-6: To avoid impacts to special-status bat species, the following shall be implemented:

1. A qualified-biologist shall conduct a preconstruction survey for suitable habitat or demolition or removal of existing structures that could support special-status bats no more than 14 days prior to initiation of ground disturbance, including tree trimming and removal.

2. If special-status bat roosts are observed, ground disturbance within 50-feet of roosts shall be restricted to between August 31 and October 15 and between March 1 and April 15 to avoid hibernation and rearing periods.
3. Removal of potential suitable bat roost trees shall occur over a two-day phased process with a qualified biologist present.
4. If bats or evidence of bat roosting is observed, exclusionary fencing and/or construction activity avoidance limits shall be put in place. Exclusion devices may include features such as one-way exits from roost habitat and shall be installed by a qualified biologist, in consultation with CDFW, and shall not occur outside of the date ranges listed above to avoid hibernation or rearing periods.
5. Survey results shall be documented in a memorandum written by the approved biologist and provided to the City of Petaluma.
6. If there is a lapse in construction activity for more than 7 consecutive days or if construction activity is phased at the work site, preconstruction bat surveys shall be repeated.
7. Following construction activities, results from any sensitive bat species survey shall be documented in a memorandum, written by the approved biologist, and provided to the City of Petaluma within 60-days following the end of construction activities.

Mitigation Measure 7 – Nesting Migratory Birds

BIO-7: To avoid impacts to special-status avian species and birds protected under the Migratory Bird Treaty Act, the following shall be implemented:

1. Site preparation activities, including tree trimming and removal, should occur outside of the bird-nesting season between September 1 and January 31. If vegetation removal or construction begins between February 1 and August 31, preconstruction nesting bird surveys shall be conducted by a qualified biologist within 14-days prior to vegetation removal or ground disturbance activities to determine presence or absence and location of nesting bird species. If active nests are present within 500-feet of construction areas, temporary protective construction exclusion zones shall be established by a qualified biologist in order to avoid direct or indirect mortality or disruption of these birds, nests or young. The appropriate buffer distance is dependent on the species, surrounding vegetation and topography and will be determined by a qualified biologist. Exclusion zones shall remain in place until all young have fledged or until the nest has been naturally abandoned or predated. Work may proceed if no active nests are found during surveys or once nests are determined by a qualified biologist to be inactive.
2. Cleared vegetation shall be collected and transported offsite to prevent birds from nesting in vegetative debris.
3. If there is a lapse in construction activity for more than 7 consecutive days or if construction activity is phased at the work site, preconstruction and nesting bird surveys shall be repeated.
4. Prior to project occupancy, residents shall be advised that dogs are to be leashed at all times within development boundaries including within 50 feet of the southern, eastern, and western riparian habitat to ensure that sensitive resources are preserved.
5. Following construction activities, results from any survey for nesting birds shall be documented in a memorandum and provided to the City of Petaluma within 60-days following the end of construction activities.

Mitigation Measure 8 – Seasonal Wetlands

BIO – 8: To minimize impacts to seasonal wetlands, the following minimization and mitigation measures shall be implemented:

1. Grading activities shall be prohibited during rain events that meet the following: within 24-hours of events predicted to deliver more than 0.2 inches of rain and within 24-hours after rain events exceeding 0.2 inches in measurable precipitation.
2. No grading shall occur after 0.5 inches of rain has occurred after November 1 in the year construction grading work is occurring unless a one-week extension based on fair weather is approved by regulatory agencies (City of Petaluma, CDFW and RWQCB).
3. To ensure no net loss of wetland functions, all unavoidable impacts to seasonal wetland habitat shall be replaced either through the creation of onsite wetland mitigation at a 1.3:1 ratio or through the purchase of mitigation credits at a 1:1 ratio at an agency-approved mitigation bank.

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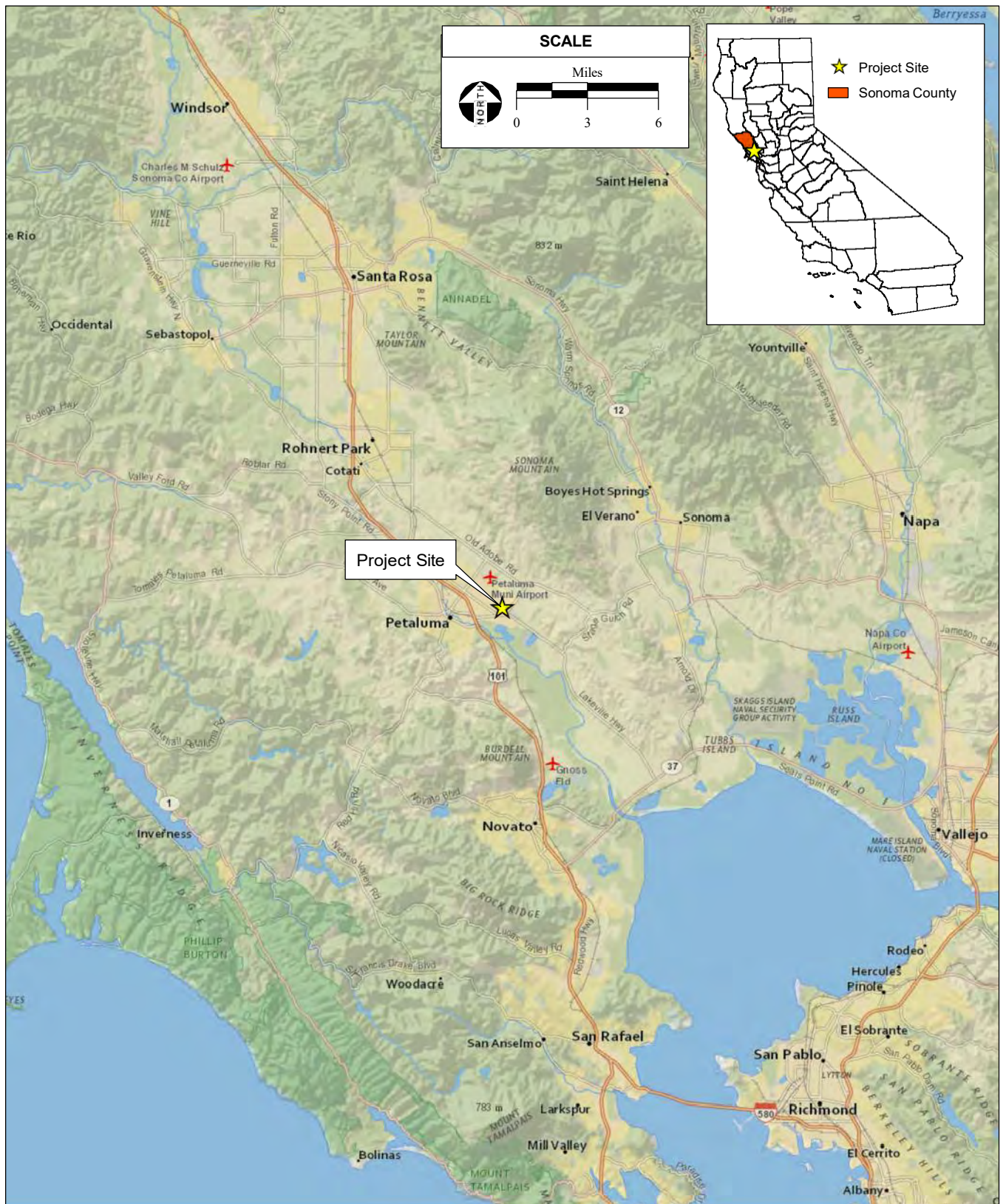
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APPENDICES

APPENDIX A

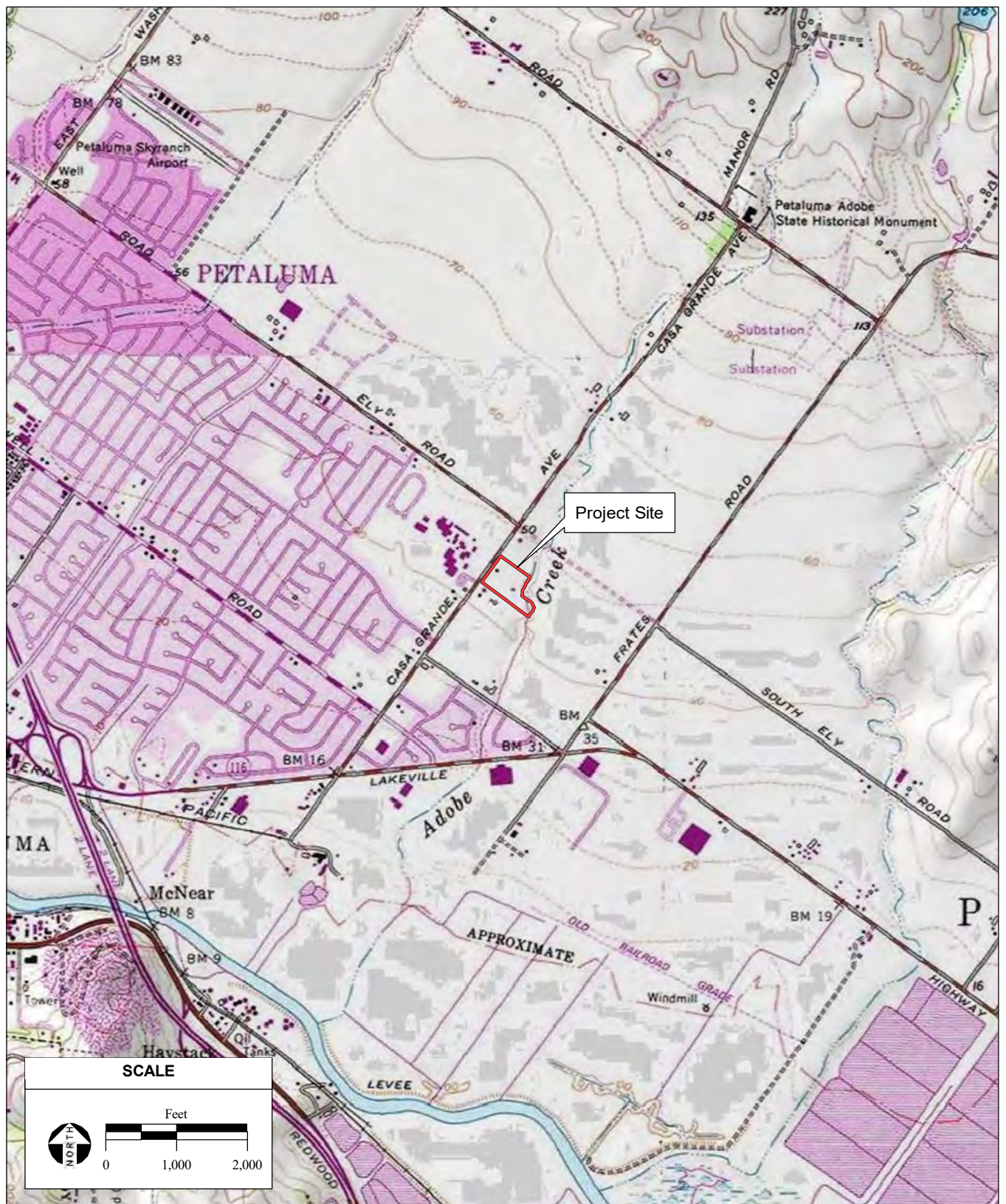
SUPPORT MAP FIGURES



SOURCE: ESRI, 2020; AES-Montrose, 12/14/2023

Creekwood Housing Development Project Biological Resources Assessment / 220517

Figure 1
Regional Location



SOURCE: "Petaluma River, CA" USGS 7.5 Minute Topographic Quadrangle, T4N R7W, Unsectioned Area of Petaluma River, Mt. Diablo Baseline & Meridian; ESRI, 2020; AES-Montrose, 12/14/2023

Creekwood Housing Development Project Biological Resources Assessment / 220517

Figure 2
Site and Vicinity



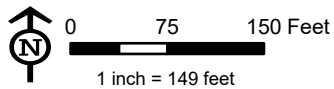
SOURCE: Sonoma County aerial photograph, 2/20/2021;
ESRI, 2020; AES-Montrose, 12/19/2023

Creekwood Housing Development Project Biological Resources Assessment / 220517 ■

Figure 3
Aerial Photograph



Source: Bing Maps Hybrid



 Project Site (6.87-acres)

Habitat Types

Annual Grassland (4.15-acres)

Developed/Disturbed (1.29-acres)

Riparian (1.22-acres)

Riverine (0.22-acre)

Wetland (0.09-acre)

Habitat Impacts

Developed/Disturbed (0.62-acre)

Annual Grassland (3.54-acres)

Wetland (0.09-acre)

Riparian (0.07-acre)

Figure 4
Habitat Components

Creekwood Residential Project



PHOTO 1: View of house and ruderal hardscape from driveway.



PHOTO 2: View of driveway to Casa Grande Road.

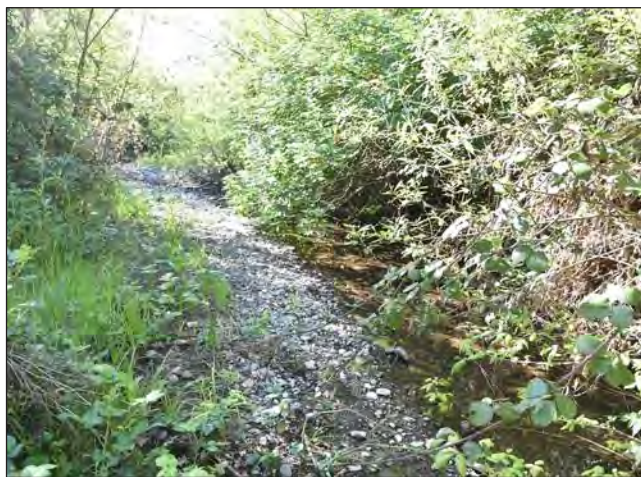


PHOTO 3: Adobe Creek.



PHOTO 4: East to west view of grazing pasture of non-native grassland fields.



PHOTO 5: West to east view of property from Casa Grande Road.



PHOTO 6: Animal pens including fields, riparian corridor in the background.

APPENDIX B

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:

December 05, 2023

Project Code: 2024-0022746

Project Name: Casa Grande Residential Development

Subject: List of threatened and endangered species that may occur in your proposed project location 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, 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 U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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 IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC 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: <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see [Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service \(fws.gov\)](https://www.fws.gov/partner/council-conservation-migratory-birds).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

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 Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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

PROJECT SUMMARY

Project Code: 2024-0022746
Project Name: Casa Grande Residential Development
Project Type: Residential Construction
Project Description: Residential Development
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.24103255,-122.59640398409951,14z>



Counties: Sonoma County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 14 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 Fisheries¹, 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.

-
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: https://ecos.fws.gov/ecp/species/613	Endangered

BIRDS

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	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 final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	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: https://ecos.fws.gov/ecp/species/6199	Threatened
Northwestern Pond Turtle <i>Actinemys marmorata</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Contra Costa Goldfields <i>Lasthenia conjugens</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7058	Endangered
Marin Dwarf-flax <i>Hesperolinon congestum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Soft Bird's-beak <i>Cordylanthus mollis ssp. mollis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8541	Endangered
Sonoma Spineflower <i>Chorizanthe valida</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7698	Endangered
Yellow Larkspur <i>Delphinium luteum</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3578	Endangered

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity

Name: Cedrick Villasenor

Address: 1801 7th Street, Suite 100

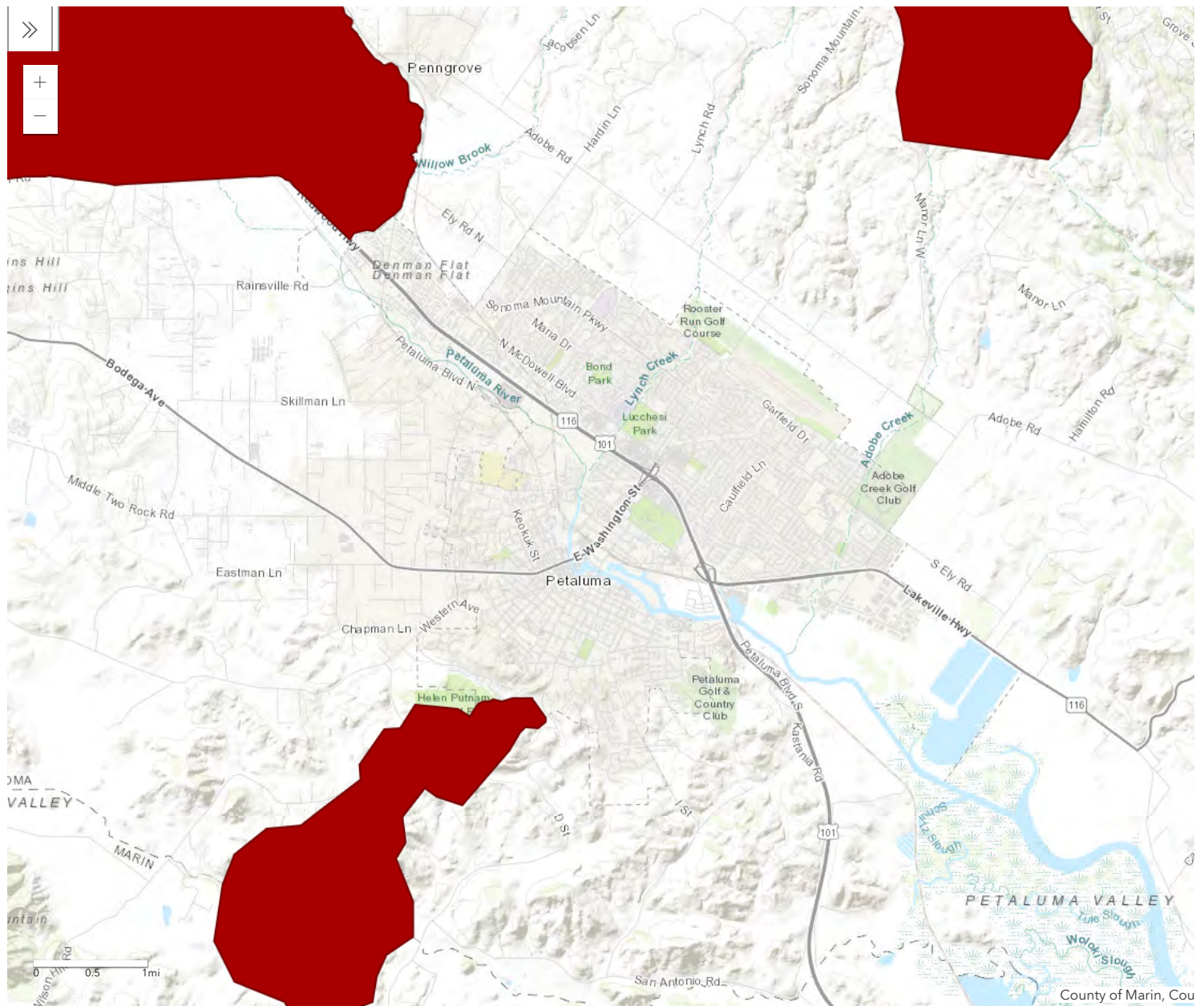
City: Sacramento

State: CA

Zip: 95811

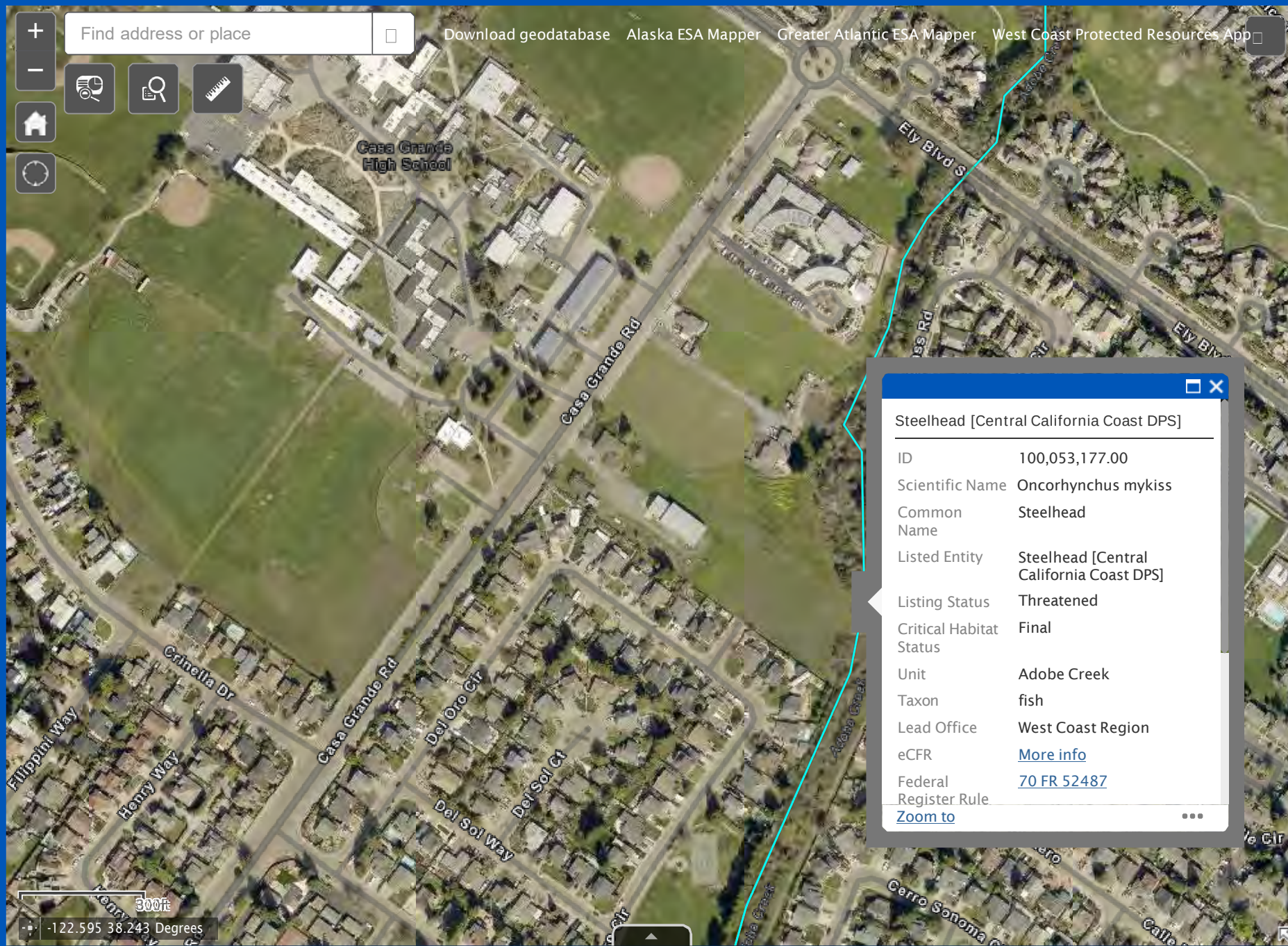
Email: cvillasenor@montrose-env.com

Phone: 9164473479





National NMFS ESA Critical Habitat Mapper

[Download geodatabase](#)[Alaska ESA Mapper](#)[Greater Atlantic ESA Mapper](#)[West Coast Protected Resources App](#)

Steelhead [Central California Coast DPS]

ID	100,053,177.00
Scientific Name	Oncorhynchus mykiss
Common Name	Steelhead
Listed Entity	Steelhead [Central California Coast DPS]
Listing Status	Threatened
Critical Habitat Status	Final
Unit	Adobe Creek
Taxon	fish
Lead Office	West Coast Region
eCFR	More info
Federal Register Rule	70 FR 52487
Zoom to	

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EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

[West Coast Regional Office](#)

EFH

No additional Essential Fish Habitats (EFH) were identified at the report location.

Pacific Salmon EFH

Link	HUC Name	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
	San Pablo Bay - Below San Pablo Dam	Chinook Salmon, Coho Salmon	All	Pacific	Pacific Coast Salmon Plan

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.

****For links to all EFH text descriptions see the complete data inventory: [open data inventory -->](#)**

Pacific Coastal Pelagic Species,

Jack Mackerel,

Pacific (Chub) Mackerel,

Pacific Sardine,

Northern Anchovy - Central Subpopulation,

Northern Anchovy - Northern Subpopulation,

Pacific Highly Migratory Species,

Bigeye Thresher Shark - North Pacific,

Bluefin Tuna - Pacific,

Dolphinfish (Dorado or Mahimahi) - Pacific,

Pelagic Thresher Shark - North Pacific,

Swordfish - North Pacific



Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: BIOS selection 5-mile Search Area

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01183	<i>Ambystoma californiense pop. 3</i> California tiger salamander - Sonoma County DPS	Endangered	Threatened	G2G3T2	S2	WL
AAAAF02020	<i>Taricha rivularis</i> red-bellied newt	None	None	G2	S2	SSC
AAAAH01020	<i>Dicamptodon ensatus</i> California giant salamander	None	None	G2G3	S2S3	SSC
AAABH01022	<i>Rana draytonii</i> California red-legged frog	Threatened	None	G2G3	S2S3	SSC
AAABH01051	<i>Rana boylei pop. 1</i> foothill yellow-legged frog - north coast DPS	None	None	G3T4	S4	SSC
ABNKC19070	<i>Buteo swainsoni</i> Swainson's hawk	None	Threatened	G5	S4	
ABNKC22010	<i>Aquila chrysaetos</i> golden eagle	None	None	G5	S3	FP
ABNME03041	<i>Laterallus jamaicensis coturniculus</i> California black rail	None	Threatened	G3T1	S2	FP
ABNME05011	<i>Rallus obsoletus obsoletus</i> California Ridgway's rail	Endangered	Endangered	G3T1	S2	FP
ABPAU08010	<i>Riparia riparia</i> bank swallow	None	Threatened	G5	S3	
ABPBX1201A	<i>Geothlypis trichas sinuosa</i> saltmarsh common yellowthroat	None	None	G5T3	S3	SSC
ABPBXA301W	<i>Melospiza melodia samuelis</i> San Pablo song sparrow	None	None	G5T2	S2	SSC
AFCHA0209G	<i>Oncorhynchus mykiss irideus pop. 8</i> steelhead - central California coast DPS	Threatened	None	G5T3Q	S3	
AFCJB34020	<i>Pogonichthys macrolepidotus</i> Sacramento splittail	None	None	G3	S3	SSC
AMACC08010	<i>Corynorhinus townsendii</i> Townsend's big-eared bat	None	None	G4	S2	SSC
AMACC10010	<i>Antrozous pallidus</i> pallid bat	None	None	G4	S3	SSC
AMAFF02040	<i>Reithrodontomys raviventris</i> salt-marsh harvest mouse	Endangered	Endangered	G1G2	S3	FP
AMAJF04010	<i>Taxidea taxus</i> American badger	None	None	G5	S3	SSC



Emys marmorata
western pond turtle
Coastal Brackish Marsh
Coastal Brackish Marsh

Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database

Proposed
Threatened

None
None

G3G4
G2

S3
S2.1

SSC





Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
IIHYM24252	<i>Bombus occidentalis</i> western bumble bee	None	Candidate Endangered	G3	S1	
IMGASJ7040	<i>Tryonia imitator</i> mimic tryonia (=California brackishwater snail)	None	None	G2	S2	
PDAST4R0P2	<i>Centromadia parryi ssp. parryi</i> pappose tarplant	None	None	G3T2	S2	1B.2
PDAST4R0W1	<i>Hemizonia congesta ssp. congesta</i> congested-headed hayfield tarplant	None	None	G5T2	S2	1B.2
PDAST5L040	<i>Lasthenia conjugens</i> Contra Costa goldfields	Endangered	None	G1	S1	1B.1
PDBOR0V0Q2	<i>Plagiobothrys mollis var. vestitus</i> Petaluma popcornflower	None	None	G4?TX	SX	1A
PDCAM060C0	<i>Downingia pusilla</i> dwarf downingia	None	None	GU	S2	2B.2
PDFAB08012	<i>Amorpha californica var. napensis</i> Napa false indigo	None	None	G4T2	S2	1B.2
PDFAB0F8R1	<i>Astragalus tener var. tener</i> alkali milk-vetch	None	None	G2T1	S1	1B.2
PDFAB40040	<i>Trifolium amoenum</i> two-fork clover	Endangered	None	G1	S1	1B.1
PDFAB402H0	<i>Trifolium polyodon</i> Pacific Grove clover	None	Rare	G1	S1	1B.1
PDMAL11012	<i>Sidalcea calycosa ssp. rhizomata</i> Point Reyes checkerbloom	None	None	G5T2	S2	1B.2
PDPGN040V0	<i>Chorizanthe valida</i> Sonoma spineflower	Endangered	Endangered	G1	S1	1B.1
PDRAN0B0Z0	<i>Delphinium luteum</i> golden larkspur	Endangered	Rare	G1	S1	1B.1
PDSCR0J0C3	<i>Chloropyron maritimum ssp. palustre</i> Point Reyes salty bird's-beak	None	None	G4?T2	S2	1B.2
PDSCR0J0D2	<i>Chloropyron molle ssp. molle</i> soft salty bird's-beak	Endangered	Rare	G2T1	S1	1B.2
PMLIL021R1	<i>Allium peninsulare var. franciscanum</i> Franciscan onion	None	None	G4G5T2	S2	1B.2
PMLIL0V0C0	<i>Fritillaria liliacea</i>	None	None	G2	S2	1B.2



Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database



PMUL1A0H3	fragrant fritillary						
	<i>Lilium pardalinum ssp. pitkinense</i>	Endangered	Endangered	G5T1	S1	1B.1	
	Pitkin Marsh lily						
PMPOA4Y070	<i>Pleuropogon hooverianus</i>	None	Threatened	G2	S2	1B.1	
	North Coast semaphore grass						

Record Count: 40



Search Results

63 matches found. Click on scientific name for details

Search Criteria: CRPR is one of [1A:1B:2A:2B:3] , Quad is one of [3812225:3812235:3812236:3812226:3812224:3812234:3812214:3812215:3812216]

▲ SCIENTIFIC NAME	COMMON NAME	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	OTHER STATUS
Allium peninsulare var. franciscanum	Franciscan onion	(Apr)May-Jun	None	None	G4G5T2	S2	1B.2	SB_CalBG/RSABG
Amorpha californica var. napensis	Napa false indigo	Apr-Jul	None	None	G4T2	S2	1B.2	SB_CalBG/RSABG
Amsinckia lunaris	bent-flowered fiddleneck	Mar-Jun	None	None	G3	S3	1B.2	BLM_S; SB_UCBG; SB_UCSC
Arctostaphylos montana ssp. montana	Mt. Tamalpais manzanita	Feb-Apr	None	None	G3T3	S3	1B.3	SB_UCBG
Arctostaphylos virgata	Marin manzanita	Jan-Mar	None	None	G2	S2	1B.2	SB_CalBG/RSABG; SB_USDA
Astragalus tener var. tener	alkali milk-vetch	Mar-Jun	None	None	G2T1	S1	1B.2	SB_UCSC
Balsamorhiza macrolepis	big-scale balsamroot	Mar-Jun	None	None	G2	S2	1B.2	BLM_S; USFS_S
Blennosperma bakeri	Sonoma sunshine	Mar-May	FE	CE	G1	S1	1B.1	SB_CalBG/RSABG
Brodiaea leptandra	narrow-anthered brodiaea	May-Jul	None	None	G3?	S3?	1B.2	SB_CalBG/RSABG
Cardamine angulata	seaside bittercress	(Jan)Mar-Jul	None	None	G4G5	S3	2B.2	
Castilleja affinis var. neglecta	Tiburon paintbrush	Apr-Jun	FE	CT	G4G5T1T2	S1S2	1B.2	SB_CalBG/RSABG; SB_UCBG
Ceanothus confusus	Rincon Ridge ceanothus	Feb-Jun	None	None	G1	S1	1B.1	BLM_S; SB_SBBG
Ceanothus decornutus	Nicasio ceanothus	Mar-May	None	None	G1	S1	1B.2	SB_CalBG/RSABG
Ceanothus masonii	Mason's ceanothus	Mar-Apr	None	CR	G1	S1	1B.2	SB_CalBG/RSABG; SB_USDA
Ceanothus sonomensis	Sonoma ceanothus	Feb-Apr	None	None	G2	S2	1B.2	SB_SBBG
Centromadia parryi ssp. parryi	pappose tarplant	May-Nov	None	None	G3T2	S2	1B.2	BLM_S
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	Jun-Oct	None	None	G4?T2	S2	1B.2	BLM_S; SB_CalBG/RSABG
Chloropyron molle ssp. molle	soft salty bird's-beak	Jun-Nov	FE	CR	G2T1	S1	1B.2	SB_CalBG/RSABG
Chorizanthe valida	Sonoma spineflower	Jun-Aug	FE	CE	G1	S1	1B.1	SB_CalBG/RSABG
Cirsium hydrophilum var. vaseyi	Mt. Tamalpais thistle	May-Aug	None	None	G2T1	S1	1B.2	SB_CalBG/RSABG
Delphinium bakeri	Baker's larkspur	Mar-May	FE	CE	G1	S1	1B.1	SB_UCBG
Delphinium luteum	golden larkspur	Mar-May	FE	CR	G1	S1	1B.1	SB_UCBG

Dirca occidentalis	western leatherwood	Jan-Mar(Apr)	None	None	G2	S2	1B.2	SB_CalBG/RSABG
Downingia pusilla	dwarf downingia	Mar-May	None	None	GU	S2	2B.2	
Entosthodon kochii	Koch's cord moss		None	None	G1	S1	1B.3	BLM_S
Erigeron biolettii	streamside daisy	Jun-Oct	None	None	G3?	S3?	3	
Eriogonum luteolum var. caninum	Tiburon buckwheat	May-Sep	None	None	G5T2	S2	1B.2	SB_CalBG/RSABG
Fritillaria lanceolata var. tristulis	Marin checker lily	Feb-May	None	None	G5T2	S2	1B.1	SB_UCSC
Fritillaria liliacea	fragrant fritillary	Feb-Apr	None	None	G2	S2	1B.2	SB_CalBG/RSABG; USFS_S
Gilia capitata ssp. tomentosa	woolly-headed gilia	May-Jul	None	None	G5T2	S2	1B.1	SB_CalBG/RSABG
Grindelia hirsutula var. maritima	San Francisco gumplant	Jun-Sep	None	None	G5T1Q	S1	3.2	SB_UCSC
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Apr-Nov	None	None	G5T2	S2	1B.2	SB_UCBG
Hesperolinon congestum	Marin western flax	Apr-Jul	FT	CT	G1	S1	1B.1	SB_CalBG/RSABG; SB_UCBG
Horkelia tenuiloba	thin-lobed horkelia	May-Jul(Aug)	None	None	G2	S2	1B.2	SB_CalBG/RSABG
Lasthenia burkei	Burke's goldfields	Apr-Jun	FE	CE	G1	S1	1B.1	SB_CalBG/RSABG; SB_UCBG
Lasthenia conjugens	Contra Costa goldfields	Mar-Jun	FE	None	G1	S1	1B.1	SB_UCBG
Legenere limosa	legenere	Apr-Jun	None	None	G2	S2	1B.1	BLM_S; SB_UCBG
Leptosiphon jepsonii	Jepson's leptosiphon	Mar-May	None	None	G2G3	S2S3	1B.2	SB_CalBG/RSABG; SB_USDA
Lessingia hololeuca	woolly-headed lessingia	Jun-Oct	None	None	G2G3	S2S3	3	
Lessingia micradenia var. micradenia	Tamalpais lessingia	(Jun)Jul-Oct	None	None	G2T2	S2	1B.2	SB_CalBG/RSABG; SB_USDA
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Jun-Jul	FE	CE	G5T1	S1	1B.1	SB_BerrySB; SB_CalBG/RSABG; SB_USDA
Limnanthes vinculans	Sebastopol meadowfoam	Apr-May	FE	CE	G1	S1	1B.1	SB_CalBG/RSABG; SB_UCBG
Lupinus sericatus	Cobb Mountain lupine	Mar-Jun	None	None	G2?	S2?	1B.2	BLM_S; SB_UCSC
Micropus amphibolus	Mt. Diablo cottonweed	Mar-May	None	None	G3G4	S3S4	3.2	SB_UCSC
Microseris paludosa	marsh microseris	Apr-Jun(Jul)	None	None	G2	S2	1B.2	BLM_S; SB_SBBG; SB_UCSC
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Apr-Jul	None	None	G4T2	S2	1B.1	SB_CalBG/RSABG
Navarretia rosulata	Marin County navarretia	May-Jul	None	None	G2	S2	1B.2	BLM_S; SB_CalBG/RSABG
Plagiobothrys mollis var. vestitus	Petaluma popcornflower	Jun-Jul	None	None	G4?TX	SX	1A	
Pleuropogon hooverianus	North Coast semaphore grass	Apr-Jun	None	CT	G2	S2	1B.1	SB_BerrySB; SB_CalBG/RSABG

Polygonum marinense	Marin knotweed	(Apr)May-Aug(Oct)	None	None	G2Q	S2	3.1	
Quercus parvula var. tamalpaisensis	Tamalpais oak	Mar-Apr	None	None	G4T2	S2	1B.3	
Rhynchospora globularis	round-headed beaked-rush	Jul-Aug	None	None	G5	S1	2B.1	
Sagittaria sanfordii	Sanford's arrowhead	May-Oct(Nov)	None	None	G3	S3	1B.2	
Sidalcea caly cosa ssp. rhizomata	Point Reyes checkerbloom	Apr-Sep	None	None	G5T2	S2	1B.2	
Sidalcea hickmanii ssp. napensis	Napa checkerbloom	Apr-Jun	None	None	G3T1	S1	1B.1	SB_CalBG/RSABG
Sidalcea hickmanii ssp. viridis	Marin checkerbloom	May-Jun	None	None	G3TH	SH	1B.1	
Streptanthus anomalus	Mount Burdell jewelflower	May-Jun	None	None	G1	S1	1B.1	SB_CalBG/RSABG
Streptanthus batrachopus	Tamalpais jewelflower	Apr-Jul	None	None	G2	S2	1B.3	SB_UCSC
Streptanthus glandulosus ssp. pulchellus	Mt. Tamalpais bristly jewelflower	May-Jul(Aug)	None	None	G4T2	S2	1B.2	SB_CalBG/RSABG
Trifolium amoenum	two-fork clover	Apr-Jun	FE	None	G1	S1	1B.1	SB_CalBG/RSABG; SB_UCBG; SB_USDA
Trifolium hydrophilum	saline clover	Apr-Jun	None	None	G2	S2	1B.2	
Trifolium polyodon	Pacific Grove clover	Apr-Jun(Jul)	None	CR	G1	S1	1B.1	BLM_S; SB_USDA
Viburnum ellipticum	oval-leaved viburnum	May-Jun	None	None	G4G5	S3?	2B.3	

Showing 1 to 63 of 63 entries

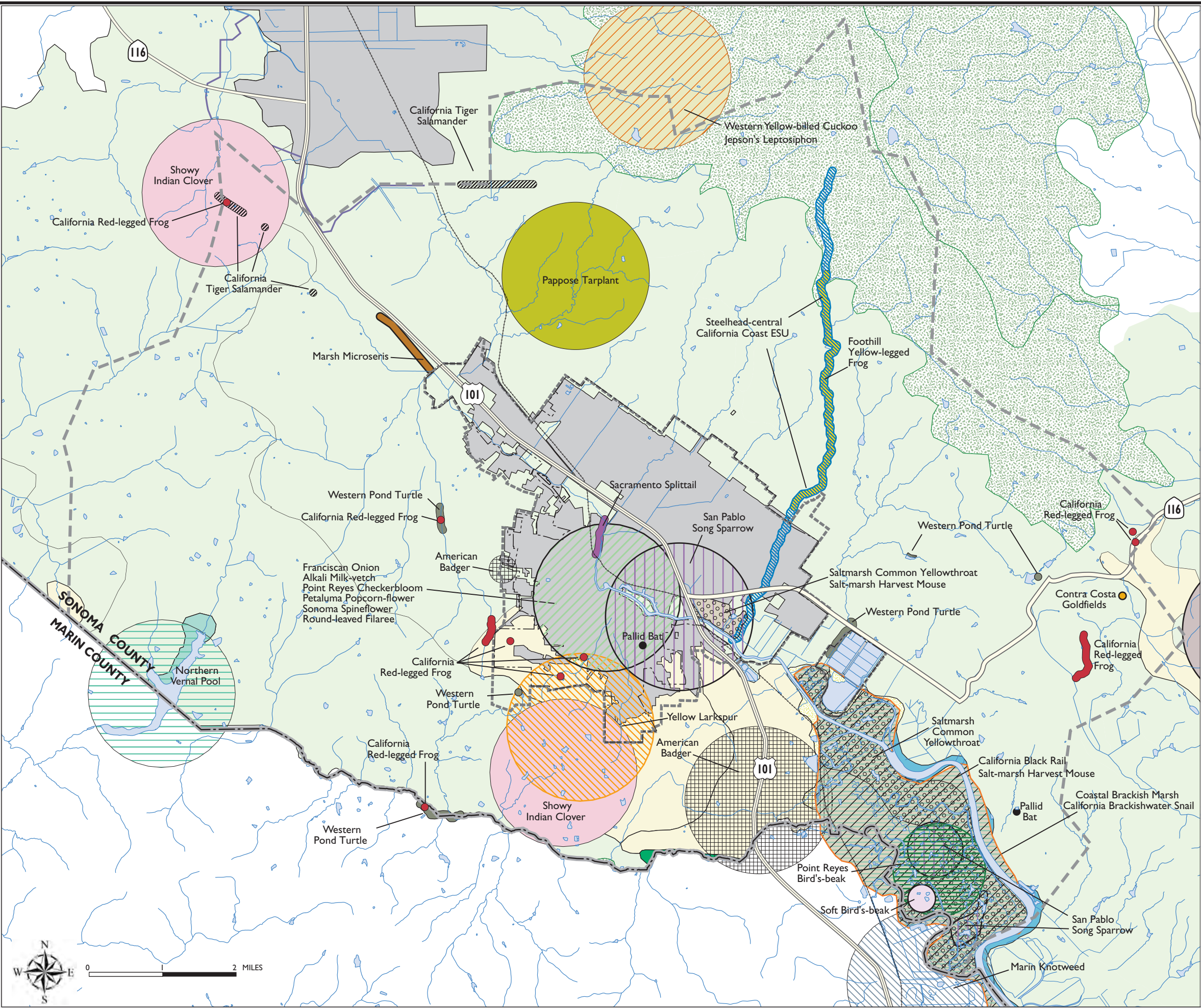
Suggested Citation:

California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website <https://www.rareplants.cnps.org> [accessed 4 December 2023].

Figure 3.8-1

HABITAT AREAS AND SPECIAL STATUS SPECIES

Petaluma General Plan 2025 EIR



- Coastal Brackish Marsh
- Montaine Hardwood
- Coastal Oak Woodland
- Annual Grassland
- Wetland Emergent Saline
- Riverine
- Lacustrine
- Cropland
- Urban
- Franciscan Onion
- Alkali Milk Vetch
- Pt Reyes Checkerbloom
- Petaluma Popcorn-flower
- Sonoma Spineflower
- Round-leaved Filaree
- Pappose Tarplant
- Jepson's Leptosiphon
- Saltmarsh Common Yellowthroat
- Marin Knotweed
- Contra Costa Goldfields
- Marsh Microseris
- Northern Vernal Pool
- Showy Indian Clover
- Yellow Larkspur
- Pt Reyes Bird's-beak
- Soft Bird's-beak
- California Brackishwater Snail
- Saltmarsh Harvest Mouse
- Pallid Bat
- American Badger
- California Black Rail
- San Pablo Song Sparrow
- Western Yellow-billed Cuckoo
- Western Pond Turtle
- Tiger Salamander
- Red-legged Frog
- Foothill Yellow-legged Frog
- Steelhead-Central
- California Coast ESU
- Sacramento Splittail
- Planning Referral Area
- Urban Growth Boundary
- City Limits
- County Line
- River and Creeks

Source: California Department of Fish and Game, California Natural Diversity Database, July 2005.



City of Petaluma
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Petaluma, CA 94952
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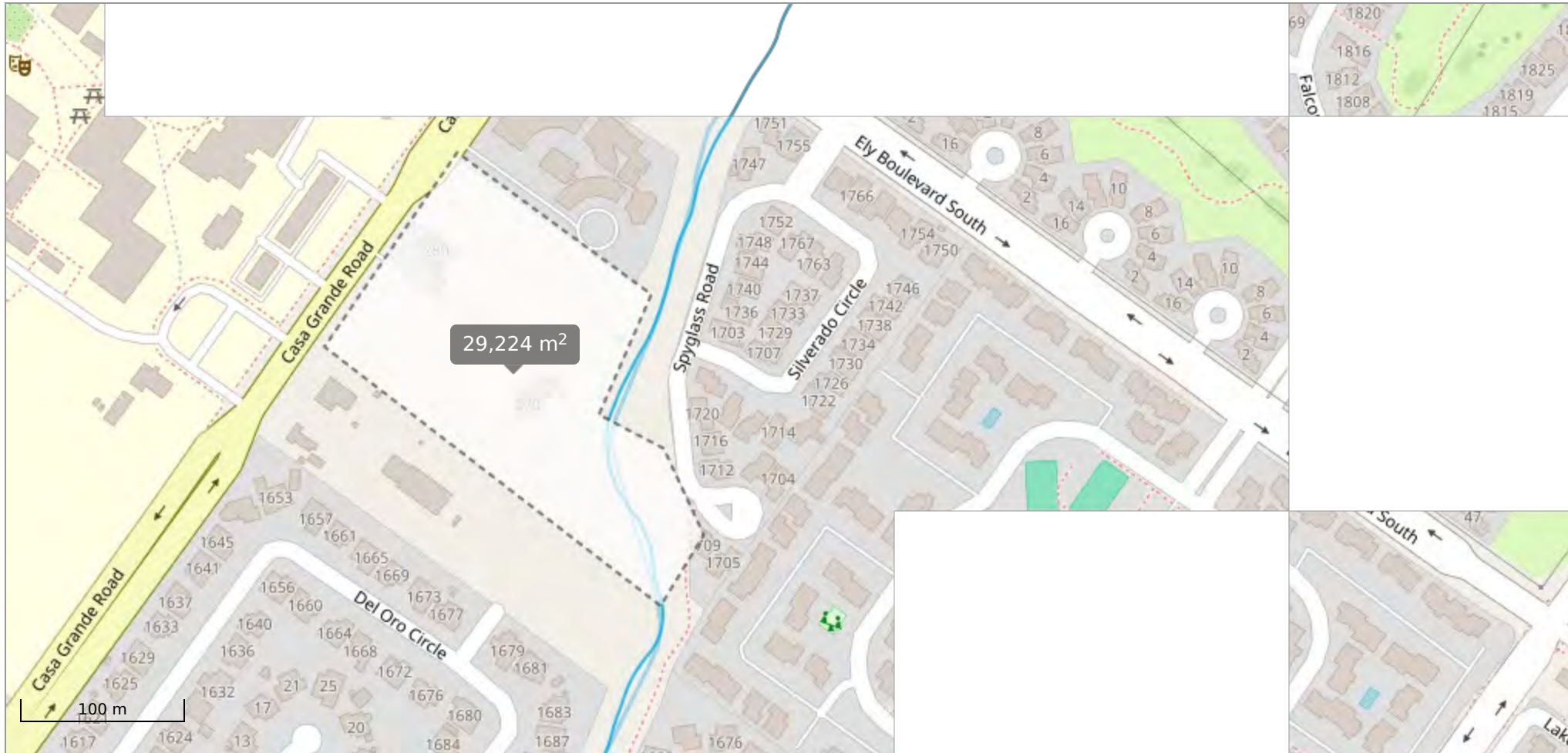
Wetlands

-  Estuarine and Marine Deepwater
 Estuarine and Marine Wetland

-  Freshwater Emergent Wetland
 Freshwater Forested/Shrub Wetland
 Freshwater Pond

-  Lake
 Other
 Riverine

National Wetlands Inventory (NWI)



Basemap data provided by © OpenStreetMap

EcoAtlas Map

Creekwood Development Project

Existing Aquatic Resources (CARI)

Rivers and Streams

- Fluvial
- Tidal

Lakes and Wetlands

Estuarine and Marine

- Eelgrass
- Tidal Flat and Marsh Panne
- Tidal Marsh
- Forested Tidal Wetland
- Managed and Muted Tidal Habitats
- Pond
- Subtidal Water
- Subtidal Vegetation
- Beach
- Dune
- Rocky Shore
- Tidal Channel

Palustrine and Riverine

- Pond and associated vegetation
- Lake, Reservoir, and associated vegetation
- Playa
- Fluvial Channel
- Riverine Vegetated
- Slope and Seep Wetlands
- Irrigated
- Vernal Pool

CRAM

- CRAM Assessment Sites
- CRAM State Reference Network Sites
- CRAM Self-Training Sites



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**



Preface

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).

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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CeA—Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14	13
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How Soil Surveys Are Made

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

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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

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 (Casa Grande 2)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

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 13, Sep 16, 2019

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 (Casa Grande 2)

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	8.0	100.0%
Totals for Area of Interest		8.0	100.0%

Map Unit Descriptions (Casa Grande 2)

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,

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

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APPENDIX C

REGIONALLY OCCURRING SPECIAL STATUS SPECIES TABLE

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES TABLE

Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
Plants					
<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	No. Suitable habitat for this species not present on site.
<i>Amsinckia lunaris</i> Bent-flowered fiddleneck	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, Sonoma, Sutter and Yolo counties.	Annual herb that grows on gravelly slopes or serpentine. Found in coastal bluff scrub, openings in cismontane woodland, valley and foothill grassland. Elevations range from; 3 to -8800 meters.	March-June	No. 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	No. Suitable habitat for this species not present on site.
<i>Arctostaphylos montana</i> ssp. <i>montana</i> Mt. Tamalpais manzanita	--/--/1B.3	Known to occur in Marin county only.	Serpentine, rocky soils. Chaparral, and valley and foothill grasslands. Elevations from:160-800 meters.	February-April	No. Suitable habitat for this species not present on site.
<i>Arctostaphylos virgata</i> Marin manzanita	--/--/1B.2	Known only to Marin County.	Broad-leaved upland forest, Closed-cone coniferous forest, Chaparral, and North Coast coniferous forest/sandstone or granitic. Elevations; 60-700 meters.	January-March	No. 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	No. Suitable habitat for this species not present on site.
<i>Balsamorhiza macrolepis</i> big-scale balsamroot	--/--/1B.2	Known to occur in Alameda, Amador, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Shasta, Solano, Sonoma, Tehama, and Tuolumne counties.	Perennial herb that sometimes occurs in serpentine soils found in chaparral, cismontane woodland, and valley and foothill grassland habitats. Elevations range from: 45-1555 meters.	March-July	No. Suitable habitat for this species not present on site.

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES TABLE

Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
<i>Blennosperma bakeri</i> Sonoma sunshine	FE/CE/1B.1	Known to occur in Mendocino and Sonoma Counties.	Annual herb found in valley and foothill grasslands, grassy margins of swales, and vernal pools. Elevations: 10-110 meters.	March-May	No. Suitable habitat for this species not present on site.
<i>Brodiaea leptandra</i> Narrow-anthered brodiaea	--/--/1B.2	Known to occur in Lake, Napa and Sonoma counties.	A perennial bulbiferous herb found in mixed-evergreen forest, broad-leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland habitats. Usually on gravelly soils. Elevations range from 40-1,220 meters.	May-July	No. Suitable habitat for this species not present on site.
<i>Cardamine angulata</i> Seaside bittercress	--/--/2B.2	Known to occur in Del Norte, Humboldt, Marin, and Siskiyou Counties.	Found in wet areas and streambanks; lower montane coniferous forest; and North Coast coniferous forest. Elevations range from 65-915 meters.	March-July	No. Suitable habitat for this species not present on site.
<i>Castilleja affinis</i> ssp. <i>neglecta</i> Tiburon paintbrush	FE/CT/1B.2	Known to occur in Marin, Napa, and Santa Clara counties.	Valley and foothill grassland (serpentine). Elevations; 60-400 meters	April-June	No. Suitable habitat for this species not present on site.
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	--/--/1B.1	Known to occur in Lake, Mendocino, Napa, and Sonoma counties.	Found in closed-cone coniferous forest, chaparral, and cismontane woodland habitats. Found in volcanic or serpentine soils. Elevations range from 75-1065 meters.	February-June	No. Suitable habitat for this species not present on site.
<i>Ceanothus masonii</i> Mason's ceanothus	--/CR/1B.2	Known to only occur in Marin County.	Occurs in valley and foothill grasslands and chaparral (openings, rocky, serpentine). Elevations; 230-500 meters.	March-April	No. Suitable habitat for this species not present on site.
<i>Ceanothus sonomensis</i> Sonoma ceanothus	--/--/1B.2	Known to occur in Napa and Sonoma counties.	Chaparral (sandy, serpentine, or volcanic soils). Elevations from 215-800 meters.	February-April	No. Suitable habitat for this species not present on site.
<i>Centromadia parryi</i> ssp. <i>parryi</i> Pappose tarplant	--/--/1B.2	Known to occur in Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, Sonoma, and Yolo Counties.	Annual herb found in chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), and valley and foothill grassland (vernally mesic)/often alkaline. Elevations: 2-420 meters.	May-November	No. 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	No. Suitable habitat for this species not present on site.
<i>Chloropyron molle</i> ssp. <i>molle</i>	FE/CR/1B.2	Known to occur in Contra Costa, Marin (though may be extirpated), Napa,	Marshes and swamps (coastal salt). Elevations: 0-3 meters.	July-November	No. Suitable habitat for this species not

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Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
soft salty bird's-beak		Sacramento (though may be extirpated), Solano, and Sonoma (though may be extirpated) counties.			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	No. Suitable habitat for this species not present on site.
<i>Cirsium hydrophilum</i> var. <i>vaseyi</i> Mt. Tamalpais thistle	--/--/1B.2	Known only to Marin County.	Broadleafed upland forest, Chaparral, Meadows and seeps/serpentine seeps. Elevations; 240-620 meters.	May-August	No. Suitable habitat for this species not present on site.
<i>Delphinium bakeri</i> Baker's larkspur	FE/CE/1B.1	Known from Marin and Sonoma counties (though may be extirpated).	Broadleafed upland forest, Coastal scrub, and Valley and foothill grassland/decomposed shale, often mesic. Elevations; 80-305 meters.	March-May	No. 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	No. Suitable habitat for this species not present on site.
<i>Dirca occidentalis</i> Western leatherwood	--/--/1B.2	Known to occur in Alameda, Contra Costa, Marin, Santa Clara, San Mateo, and Sonoma counties.	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, and Riparian woodland/mesic. Elevations; 25-425 meters.	January-March (April)	No. Suitable habitat for this species not present on site.
<i>Downingia pusilla</i> Dwarf downingia	--/--/2B.2	Known to occur in Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties. Also occurs in South America.	Valley and foothill grassland (mesic) and vernal pools and roadside ditches. Elevations: 1-445 meters.	March-May	No. Suitable habitat for this species not present on site.
<i>Entosthodon kochii</i> Koch's cord moss	--/--/1B.3	Known to occur in Mendocino, Mariposa, Marin, and San Luis Obispo counties.	Moss found in cismontane woodland (soil). Elevations; 180-1000 meters.	Year Round	No. Suitable habitat for this species not present 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.	Serpentinite, sandy to gravelly soils. Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Elevations from 0-700 meters.	May-September	No. Suitable habitat for this species not present on site.
<i>Erigeron biolettii</i> Streamside daisy	--/--/3	Known to occur in Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma counties.	Found in broadleafed upland forest, cismontane woodland, and North Coast coniferous forest habitats. Found in rocky, mesic soils. Elevations range from 30-1100 meters.	June-October	No. Suitable habitat for this species not present on site.

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Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
<i>Fritillaria lanceolata</i> var. <i>tristulis</i> Marin checker lily	--/--/1B.1	Known only to Marin and San Mateo County.	Coastal bluff scrub, Coastal prairie, and Coastal scrub. Elevations; 15-150 meters.	February-May	No. 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	No. Suitable habitat for this species not present on site.
<i>Gilia capitata</i> ssp. <i>tomentosa</i> woolly-headed gilia	--/--/1B.1	Known to occur in Marin and Sonoma counties.	An annual herb that is found in serpentine, rocky, outcrops, coastal bluff scrub, and valley and foothill grasslands. Elevation range: 10-220 meters.	May-July	No. Suitable habitat for this species not present on site.
<i>Grindelia hirsutula</i> var. <i>maritima</i> San Francisco gumplant	--/--/3.2	Known to occur in Marin, San Francisco, San Luis Obispo, San Mateo counties.	Perennial herb found in coastal bluff scrub, coastal scrub, and valley foothill grassland. Elevation range 15 - 400 meters	Jun-September	No. 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	Yes. Suitable habitat for this species present on site.
<i>Hesperolinon</i> <i>congestum</i> Marin dwarf 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	No. Suitable habitat for this species not present on site.
<i>Horkelia tenuiloba</i> thin-lobed horkelia	--/--/1B.2	Known to occur in Mendocino, Marin, and Sonoma counties.	Perennial herb found in mesic openings, sandy soils. Broadleaved upland forest, chaparral, and valley and foothill grassland. Elevations from: 50-500 meters.	April-August	No. Suitable habitat for this species not present on site.
<i>Lasthenia burkei</i> Burke's goldfields	FE/CE/1B.1	Known to occur in Lake, Mendocino, Napa, and Sonoma Counties	Annual herb occurs in meadows and seeps (mesic), and vernal pools at elevations from 15-600 meters	April-June	No. Suitable habitat for this species not present on site.
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE/--/1B.1	Known to occur in Alameda, Sonoma, Contra Costa, Monterey, Marin, Napa, as well as Santa Barbara, Santa Clara, and Mendocino counties (though may be extirpated).	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, and Vernal pools/mesic. Elevations: 0-470 meters.	March-June	No. 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.	June-July	No. Suitable habitat for this species not present on site.

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<i>Scientific Name</i> Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
			Elevation: 35-65 meters		
<i>Limnanthes vincularis</i> Sebastopol meadowfoam	FE/CE/1B.1	Known to occur in Napa and Sonoma Counties.	Annual herb found in wet vernally mesic meadows and seeps, valley and foothill grassland, and vernal pool habitat. Elevations range from 15-305 meters.	April-May	No. Suitable habitat for this species not present on site.
<i>Legenere limosa</i> Legenere	--/--/1B.1	Known to occur in Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	Annual herb occurs in wet areas, ponds, and vernal pools. Elevations range from 1-880 meters.	April-June	No. Suitable habitat for this species not present on site.
<i>Leptosiphon jepsonii</i> Jepson's leptosiphon	--/--/1B.2	Known to occur in Lake, Napa, Sonoma, and Yolo counties.	Found in chaparral, cismontane woodland, and valley and foothill grassland. Typically occurs in volcanic soils. Elevations range from 100-500 meters.	March-May	No. Suitable habitat for this species not present on site.
<i>Lessingia hololeuca</i> woolly-headed lessingia	--/--/3	Known to occur in Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo counties.	An annual herb found in clay and serpentine soils within broadleafed upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats. Elevations range from 13-305 meters.	June-October	No. Suitable habitat for this species not present on site.
<i>Lessingia micradenia</i> var. <i>micradenia</i> Tamalpais lessingia	--/--/1B.2	Known to occur within the Bolinas, Novato, San Geronimo, San Rafael USGS quadrangles.	Serpentine tolerant species found within roadside disturbance, chaparral, and valley and foothill grassland. Elevations range from 100 - 500 meters.	June-October	No. Suitable habitat for this species not present on site.
<i>Lomatium repostum</i> Napa lomatium	--/--/4.3	Known to occur in Lake, Napa, Solano, and Sonoma counties.	Found in chaparral and cismontane woodland habitats. Found in serpentine soils. Elevations range from 90-830 meters.	March-June	No. Suitable habitat for this species not present on site.
<i>Lupinus sericatus</i> Cobb Mountain lupine	--/--/1B.2	Known to occur in Colusa, Lake, Napa, and Sonoma counties.	Perennial herb found on slopes with open broad-leafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest. Elevations range from 275-1,525 meters.	March-June	No. Suitable habitat for this species not present on site.
<i>Micropus amphibolus</i> Mt. Diablo cottonweed	--/--/3.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties.	Found in broadleafed upland forest, chaparral, cismontane woodland, and valley and foothill grassland habitats. Openings on slopes, ridges, shallow soils, and sedimentary or volcanic rocks. Elevations range from 45-825 meters.	March-May	No. Suitable habitat for this species not present on site.
<i>Microseris paludosa</i> marsh microseris	--/--/1B.2	Known to occur in Mendocino, Monterey, Marin, San Benito, Santa Cruz, San Francisco (though may be extirpated), San Luis Obispo, San Mateo	Perennial herb found in moist valley and foothill grasslands, open woodlands, closed-cone coniferous forest, coastal scrub. Elevations range from; 5-355 meters.	April-July	No. Suitable habitat for this species not present on site.

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Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
		(though may be extirpated), Solano, and Sonoma counties.			
<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	No. Suitable habitat for this species not present on site.
<i>Navarretia rosulata</i> Marin county navarretia	--/--/1B.2	Known to occur in Marin and Napa counties.	Found in serpentine, rocky soils in closed-cone coniferous forest or chaparral. Elevations range from 656 to 2,083 feet.	May- July	No. Suitable habitat for this species not present 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	No. Suitable habitat for this species not present on site.
<i>Pleuropogon hooverianus</i> North Coast semaphore grass	--/CT/1B.1	Known to occur in Mendocino, Marin, and Sonoma counties.	Broadleaved upland forest, Meadows and seeps, and North Coast coniferous forest/open areas, mesic. Elevations; 10-671 meters.	April-June	No. Suitable habitat for this species not present on site.
<i>Polygonum marinense</i> Marin Knotweed	--/--/3.1	Known to occur in Alameda, Humboldt, Marin, Napa, Solano, and Sonoma Counties.	Found in coastal salt marsh and wetland/riparian habitats.	May-August	No. Suitable habitat for this species not present on site.
<i>Quercus parvula</i> var. <i>tamalpaisensis</i> Tamalpais oak	--/--/1B.3	Known to occur in Marin County.	Perennial evergreen shrub-tree found in lower montane coniferous forests within the Mt. Tamalpais and north bay areas. Elevations range from 100 - 750 meters.	Year-round, March-April	No. Suitable habitat for this species not present on site.
<i>Rhynchospora globularis</i> round-headed beaked-rush	--/--/2B.1	Within California known only in Sonoma County.	Perennial rhizomatous herb found in freshwater wetlands, marshes and in riparian areas. Elevations range from 40 - 60 meters.	July-August	No. Suitable habitat for this species not present on site.
<i>Sagittaria sanfordii</i> Sanford's arrowhead	--/--/1B.2	Known to occur in Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Ventura, and Yuba counties. However, it is presumed extirpated in Orange and Ventura counties.	Found in marshes and swamps (assorted shallow freshwater). Elevations range from 0-650 meters.	May-October (November)	Yes. Suitable habitat for this species present on site.

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Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur 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	No. Suitable habitat for this species not present on site.
<i>Sidalcea hickmanii</i> ssp. <i>napensis</i> Napa checkerbloom	--/--/1B.1	Known to occur in Napa and Sonoma counties.	Found in chaparral (rhyolitic). Elevations range from 415-610 meters.	April-June	No. Suitable habitat for this species not present on site.
<i>Sidalcea hickmanii</i> ssp. <i>viridis</i> Marin checkerbloom	--/--/1B.1	Known to occur in Marin County.	Perennial herb found within serpentinite chapparal. Elevations range from 50 - 430 meters.	May-June	No. Suitable habitat for this species not present on site.
<i>Streptanthus anomalus</i> Mount Burdell jewelflower	--/--/1B.1	Known to occur in Marin and possibly Sonoma counties.	An annual herb found in cismontane woodland and serpentine openings microhabitat. Elevations range from 50 - 150 meters.	May-June	No. Suitable habitat for this species not present on site.
<i>Streptanthus</i> <i>batrachopus</i> Tamalpais jewelflower	--/--/1B.3	Known to occur in Lake and Marin counties.	An annual herb found in serpentine, closed-cone coniferous forest and chaparral. Elevations range from 305-650 meters.	April-July	No. Suitable habitat for this species not present on site.
<i>Streptanthus</i> <i>glandulosus</i> ssp. <i>pulchellus</i> Mt. Tamalpais bristly jewel-flower	--/--/1B.2	Known to occur in Marin county only.	Serpentine. Chaparral, and valley and foothill grassland. Elevations from 150-800 meters.	May-August	No. Suitable habitat for this species not present on site.
<i>Trifolium amoenum</i> two-fork clover	FE/--/1B.1	Known to occur in Alameda (though may be extirpated), Marin, Napa (though may be extirpated), Santa Clara (though may be extirpated), San Mateo, Solano (though may be extirpated), and Sonoma (though may be extirpated/uncertain) counties.	Annual herb found in coastal bluff scrub and valley and foothill grassland habitats sometime in serpentine at elevations ranging from 5 - 415 meters.	April-June	No. Suitable habitat for this species not present on site.
<i>Trifolium hydrophilum</i> saline clover	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo counties. However, this species is unconfirmed in Colusa county.	Annual herb found in marshes and swamps, valley and foothill grassland that are occasionally on mesic, alkaline soils, and vernal pools. Elevations range from 0-300 meters.	April-June	No. Suitable habitat for this species not present on site.

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Scientific Name Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur 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 wetlands of mesic meadows, coastal prairie, closed-cone pine forest, and riparian.	April-June (July)	Yes. Suitable habitat for this species present on site.
<i>Viburnum ellipticum</i> oval-leaved viburnum	--/--/2B.3	Known to occur in Alameda, Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Lake, Mendocino, Mariposa, Napa, Placer, Shasta, Solano, Sonoma, and Tehama counties.	Perennial deciduous shrub found in chaparral, cismontane woodland, and lower montane coniferous forest. Generally north facing slopes. Elevations from 215-1400 meters.	May-August	No. Suitable habitat for this species not present on site.
Animals					
Invertebrates					
<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	Yes. Suitable habitat for this species present on site.
<i>Danus plexippus</i> Monarch butterfly	FC/--/--	Known to occur in Mexico and north America. Populations that occur where winter conditions are not suitable travel along well-established migratory routes to overwintering areas. Overwintering sites are known to occur in Mexico and coastal California.	Migratory populations begin migration in the fall and can be found along established migratory routes where nectar sources are available. During breeding (typically February to March), monarch butterflies require milkweed to lay their eggs on. Overwintering monarchs require sites with sufficient roosts for the population (such as eucalyptus trees) that provide appropriate sunlight and shelter from the wind. Where climate is suitable for year-round habitation, monarchs are found in areas with nectar sources and milkweed as breeding can occur yearround.	Year-round	No. Suitable habitat for this species not present on site.
Fish					
<i>Oncorhynchus mykiss</i> <i>irideus</i> pop. 8 Steelhead-Central California Coast DPS	FT/--/--	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	Yes. Suitable habitat for this species present on site.
<i>Pogonichthys</i> <i>macrolepidotus</i> Sacramento splittail	--/CSC/--	Endemic to the Central Valley. Occurs below the Red Bluff Diversion Dam in Tehama County to the downstream	Predominantly freshwater estuarine systems. Prefers low-salinity, shallow-water habitats. Occurs in slow-moving sections of rivers, sloughs, and marshes.	Consult Agency	No. Suitable habitat for this species not present on site.

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		reaches of the Sacramento and American Rivers. Also occurs in the lower reaches of the Feather, Merced, and the San Joaquin Rivers. This species is largely confined to the Delta, Suisun Bay, Suisun Marsh, Napa River, Petaluma River, and Sacramento-San Joaquin estuary.	Abundance is strongly tied to outflows, because spawning occurs over flooded vegetation.		
Amphibians					
<i>Ambystoma californiense</i> California tiger salamander	FT/CT, WL/--	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)	No. Suitable habitat for this species not present on site.
<i>Dicamptodon ensatus</i> California giant salamander	--/CSC/--	Known to occur in Mendocino, Lake, Glenn, Sonoma, Marin, San Mateo, Santa Cruz and historically Monterey counties.	Occurs in wet coastal forests near streams and seepages.	Consult Agency	No. Suitable habitat for this species not present on site.
<i>Rana boylei</i> pop. 1 foothill yellow-legged frog – north coast DPS	--/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)	Yes. 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 foothills of the Sierra Nevadas, 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)	Yes. Suitable habitat for this species present on site.
<i>Taricha rivularis</i> red-bellied newt	--/CSC/--	Known to occur in the Coast Range from Mendocino County to San Diego County.	Occurs primarily in valley-foothill hardwood, hardwood-conifer, coastal scrub, and mixed chaparral	Fall-Late Spring	No. Suitable habitat for this species not

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<i>Scientific Name</i> Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
		Also known in the Peninsular Ranges, south of Boulder Creek, and in the southern Sierra Nevada foothills.	but may occur in annual grassland and mixed conifer forests. Elevation ranges from sea level to 1,830 meters.		present on site.
Reptiles					
<i>Chelonia mydas</i> green sea turtle	FT/--/--	Globally distributed in tropical and subtropical waters along continental coasts and islands between 30° N and 30° S. In the eastern North Pacific, occurs from Baja California to Alaska.	Nests on oceanic beaches, feeds in benthic grounds in coastal areas, and frequents convergence zones in the open ocean.	Consult Agency	No. Suitable habitat for this species not present on site.
<i>Emys (Actinemys) marmorata</i> western (northwestern) pond turtle	FPT/CSC/--	Distribution ranges from Washington to northern Baja California.	Inhabit rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent wetlands with basking sites.	Year-round	Yes. Suitable habitat for this species present on site.
Birds					
<i>Aquila chrysaetos</i> Golden eagle	--/FP, WL/--	Known to occur in Alameda, Colusa, Contra Costa, El Dorado*, Fresno, Humboldt, Kern, Lake, Lassen, Los Angeles, Madera, Merced, Modoc, Mono, Monterey, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Santa Clara, Siskiyou, Solano, Stanislaus, Trinity, Tulare, and Ventura counties.	Generally open country, in prairies, arctic and alpine tundra, open wooded country, and barren areas, especially in hilly or mountainous regions.	February-March	No. Suitable habitat for this species not 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	Yes. Suitable habitat for this species present on site.
<i>Charadrius nivosus 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	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	All Year	No. Suitable habitat for this species not present on site.

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES TABLE

<i>Scientific Name</i> Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
		mainly in coastal areas from southern Washington to Central America (72 FR 184).	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).		
<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	No. 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	No. 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	No. Suitable habitat for this species not present on site.
<i>Rallus longirostris (obsoletus) obsoletus</i> California Ridgway's (clapper) 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 with abundant cordgrass and near tidal sloughs. Builds platforms concealed by canopies of woven cordgrass stems or pickleweed and gumweed. Uses dead drift vegetation as platform. In fresh or brackish water, builds nest in dense cattail or bulrush. Forages in high marsh vegetation along vegetation and mudflat interface and along tidal creeks.	All year	No. 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	Colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-	All year	No. Suitable habitat for this species not present on site.

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES TABLE

<i>Scientific Name</i> Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
		River. Other colonies persist along the central coast from Monterey to San Mateo counties, and northeastern California in Shasta, Siskiyou, Lassen, Plumas, and Modoc counties.	textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.		
<i>Sternula antillarum browni</i> California least tern	FE/CE, FP/--	Found along the Pacific Coast of California, from San Francisco southward to Baja.	Nest in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action.	All year	No. Suitable habitat for this species not present on site.
<i>Strix occidentalis caurina</i> northern spotted owl	FT/CT/--	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 to approximately 2,300 meters. Prefer old-growth forests but use of managed (previously logged) lands is not uncommon. Do not use logged habitat until approximately 60 years after logging unless larger trees or snags remain. 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.	Year-round	No. Suitable habitat for this species not present on site.
Mammals					
<i>Antrozous pallidus 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	Yes. 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 hollowed-out redwoods for roosting. Hibernation sites must be cold, but above freezing.	Year-round	No. Suitable habitat for this species not present on site.
<i>Reithrodontomys raviventris</i> salt marsh harvest	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	All Year	No. Suitable habitat for this species not present on site.

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES TABLE

<i>Scientific Name</i> Common Name	Federal/State /CNPS List	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On-Site
mouse			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.		
<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.	All Year	No. Suitable habitat for this species not present on site.

SOURCE: Appendix B

STATUS CODES:

Federal: United States Fish and Wildlife Service

FE Federally Endangered
 FT Federally Threatened
 FPT Federally Proposed Threatened
 FPE Federally Proposed Endangered
 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
 FP Fully Protected Species

WL California Watch List

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
 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)

APPENDIX D

VASCULAR PLANT SPECIES OBSERVED

**Vascular Plant Species Observed Within the Study Area on
April 15, June 15, July 31, 2020, April 29, 2022, May 17, 2023
Creekwood Housing Development Project**

Scientific Name	Common Name	WIS
<i>Acer negundo</i>	boxelder	FACW
<i>Acer macrophyllum</i>	big leaf maple	FAC
<i>Aesculus californicum</i>	California buckeye	N/A
<i>Agrostis exarata</i> *	spike bentgrass	FACW
<i>Alisma triviale</i>	water plantain	OBL
<i>Amsinckia intermedia</i>	common fiddleneck	N/A
<i>Artemisia douglasiana</i>	California mugwort	FAC
<i>Capsella bursa-pastoris</i> *	shepherd's purse	FACU
<i>Cirsium vulgare</i> *	bull thistle	FACU
<i>Conium maculatum</i> *	poison hemlock	FACW
<i>Convolvulus arvensis</i> *	field bindweed	N/A
<i>Cornus sericea</i>	dogwood	N/A
<i>Crataegus monogyna</i> *	hawthorn	FAC
<i>Crypsis schoenoides</i>	swamp Prickle Grass	FACW
<i>Cyperus eragrostis</i>	tall cyperus	FACW
<i>Dactylis glomerata</i> *	orchard grass	FACU
<i>Dysphania ambrosioides</i> *	Mexican tea	FAC
<i>Baccharis pilularis</i>	coyote bush	N/A
<i>Epilobium ciliatum</i>	slender willow herb	FACW
<i>Festuca perennis</i> *	Italian rye grass	FAC
<i>Fraxinus latifolia</i>	Oregon ash	FACW
<i>Foeniculum vulgare</i> *	fennel	N/A
<i>Hedera helix</i> *	English ivy	FACU
<i>Helminthotheca echioides</i>	bristly ox-tongue	FACU
<i>Hirschfeldia incana</i> *	short podded mustard	N/A
<i>Hordeum marinum</i>	seaside barley	FAC
<i>Lactuca serriola</i> *	prickly lettuce	FACU
<i>Lathyrus sp.</i>	pea	N/A
<i>Lepidium latifolium</i> *	perennial pepperweed	FAC
<i>Lotus corniculatus</i> *	bird's foot trefoil	FAC
<i>Lythrum hyssopifolium</i>	hyssop loosestrife	OBL
<i>Juncus bufonius</i>	toad rush	FACW
<i>Medicago polymorpha</i> *	bur clover	FACU
<i>Mentha pulegium</i> *	pennyroyal	OBL
<i>Nasturtium officinale</i>	watercress	OBL
<i>Phalaris aquatic</i> *	harding grass	FACU
<i>Phalaris paradoxa</i>	hood canary grass	FAC
<i>Plagiobothrys bracteatus</i>	bracted popcorn-flower	FACW
<i>Quercus agrifolia</i>	coast live oak	N/A
<i>Quercus lobata</i>	valley oak	FACU
<i>Ranunculus sp.</i>	buttercup	N/A

Scientific Name	Common Name	WIS
<i>Umbellularia californica</i>	California bay	FAC
<i>Rorippa curvisiliqua</i>	curve-pod yellowcress	OBL
<i>Rubus armeniacus</i> *	Himalayan blackberry	FAC
<i>Rubus ursinus</i>	California blackberry	FAC
<i>Rumex acetosella</i>	garden sorrel	FACU
<i>Rumex conglomeratus</i>	clustered dock	FACW
<i>Salix laevigata</i>	red willow	FACW
<i>Salix lasiolepis</i>	arroyo willow	FACW
<i>Sequoia sempervirens</i>	coast redwood	N/A
<i>Sonchus oleraceus</i> *	sow thistle	UPL
<i>Stachys ajugoides</i>	ajuga hedge nettle	OBL
<i>Trifolium dubium</i>	little hop clover	UPL
<i>Trifolium hirtum</i> *	rose clover	UPL
<i>Trifolium microdon</i>	thimble clover	UPL
<i>Trifolium subterraneum</i> *	subterranean clover	UPL
<i>Veronica persica</i> *	birdeye speedwell	N/A
<i>Vicia sativa</i> *	Spring vetch	FACU
<i>Xanthium spinosum</i> *	spiny cocklebur	FACU

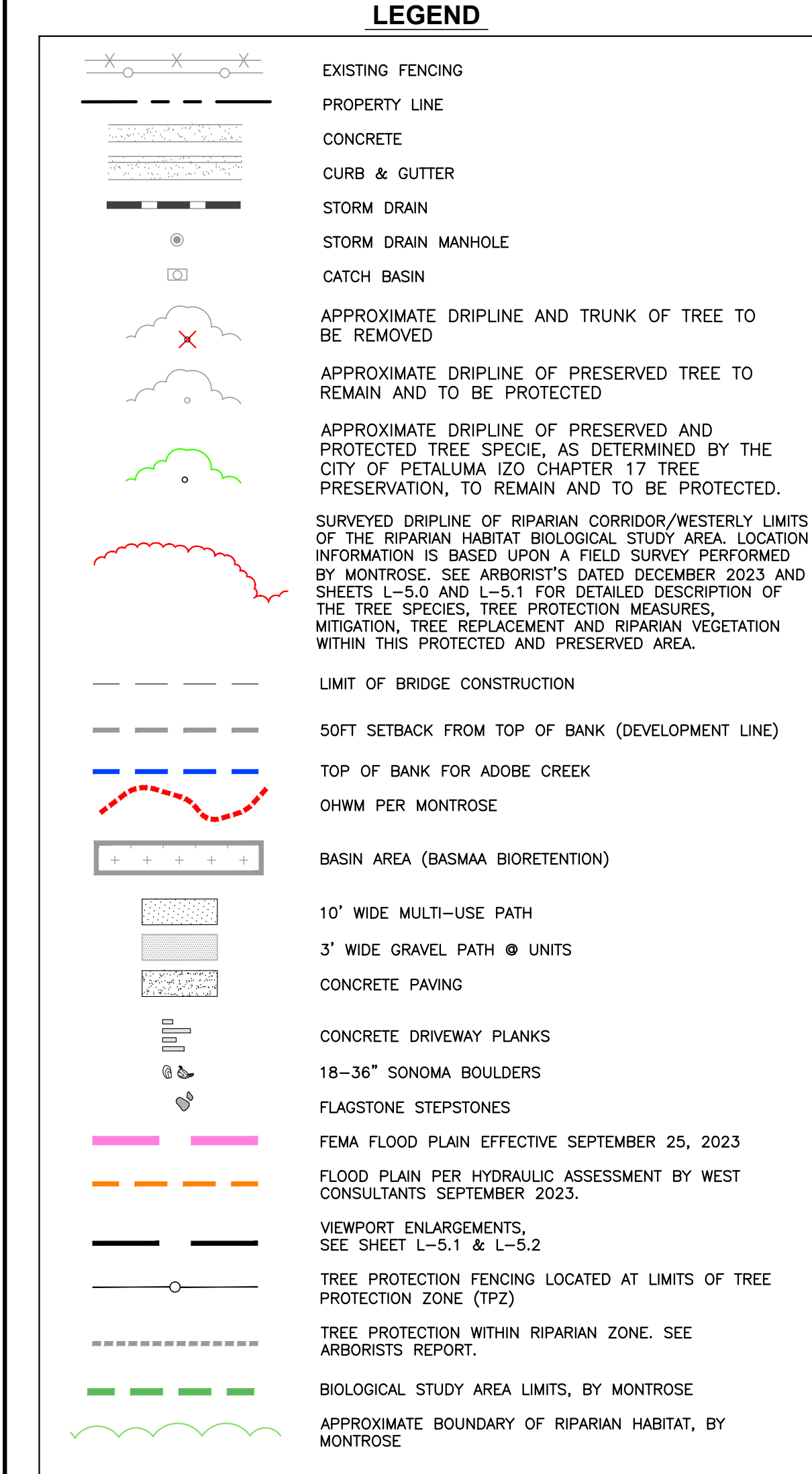
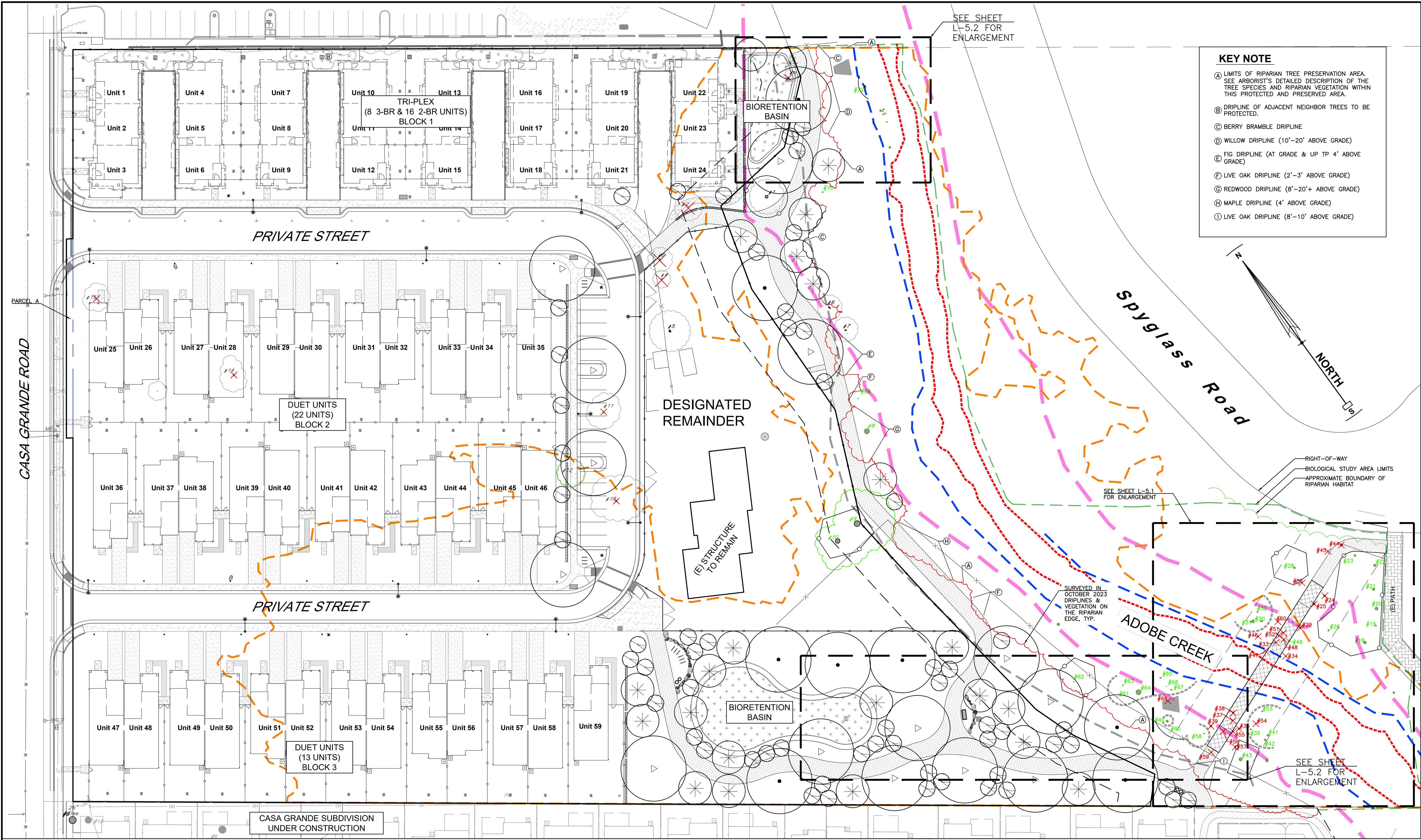
* = Non-native

Wetland Indicator Status (WIS)

OBL = Occurs in aquatic resources >99% of time
 FACW = Occurs in aquatic resources 67-99% of time
 FACU = Occurs in aquatic resources 34-66% of time
 UPL = Occurs in aquatic resources 1-33% of time
 NI = Indicator status not known in this region

APPENDIX E

TREE REMOVAL, PRESERVATION & REPLACEMENT PLANS



REPLACEMENT TREE (MITIGATION TREES) SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	SIZE (HxW)	QUANTITY	WATER USE
	QUERCUS AGRIFOLIA (MITIGATION TREE)	COAST LIVE OAK	24" BOX	65"x105"	14	L
	QUERCUS LOBATA (MITIGATION TREE)	VALLEY OAK	24" BOX	80"x90"	8	L
	AESCLUSUS CALIFORNICA (MITIGATION TREE)	CALIFORNIA BUCKEYE	24" BOX	30"x40"	23	L
	CERCIS OCCIDENTALIS (MITIGATION TREE)	WESTERN REDBUD	15 GAL	15"x10"	26	L
	CERCIS OCCIDENTALIS	WESTERN REDBUD	15 GAL	15"x10"	30	L

Tree Replacement Calculations
(1:1 Mitigation Replacement Ratio with select 2:1 Mitigation)

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health Condition	Calculated Obh	Mitigation Ratio	Number of Replacement Trees
24	Coast Live Oak	Quercus agrifolia	8.5, 7.5	5	12.3	1 to 1	6.1
25	Coast Live Oak	Quercus agrifolia	12.5	5	12.5	1 to 1	6.3
27	Valley Oak	Quercus lobata	6	5	6.0	1 to 1	3.0
29	Valley Oak	Quercus lobata	10	4	10.0	1 to 1	5.0
33	California Walnut	Juglans hindsii	6	5	6.0	1 to 1	3.0
34	Oregon Ash	Fraxinus latifolia	6	5	6.0	1 to 1	3.0
36	Red Willow	Salix laevigata	9.5	4	9.5	1 to 1	4.8
37	Red Willow	Salix laevigata	8	3	8.0	1 to 1	4.0
38	Red Willow	Salix laevigata	11	4	11.0	1 to 1	5.5
39	California Buckeye	Aesculus californica	6, 6.5	4	11.5	1 to 1	5.8
*44	Red Willow	Salix laevigata	17.5	2	17.5	2 to 1	4.4
45	Valley Oak	Quercus lobata	7	5	7.0	1 to 1	3.5
46	Oregon Ash	Fraxinus latifolia	1.5	4	1.5	1 to 1	0.8
*47	Red Willow	Salix laevigata	3	2	3.0	2 to 1	0.8
48	Red Willow	Salix laevigata	3	4	3.0	1 to 1	1.5
*50	Red Willow	Salix laevigata	5, 3, 3, 3	2	8.0	2 to 1	2.0
51	Red Willow	Salix laevigata	3.5	3	3.5	1 to 1	1.8
52	California Buckeye	Aesculus californica	1.5	4	1.5	1 to 1	0.8
54	Red Willow	Salix laevigata	3	3	3.0	1 to 1	1.5
55	California Buckeye	Aesculus californica	3.5	4	3.5	1 to 1	1.8
56	California Buckeye	Aesculus californica	3, 2.5, 2.5	4	5.0	1 to 1	2.5
*57	California Buckeye	Aesculus californica	5, 2.5	2	6.0	2 to 1	1.5
59	Toyon	Heteromeles arbutifolia	3, 1.5	4	4.0	1 to 1	1.5
68	California Buckeye	Aesculus californica	4	4	4.0	1 to 1	2.0

TREE MITIGATION NOTES

- MITIGATION FOR THE TREES REMOVED WITHIN THE AREA WILL BE TO THE CITY OF PETALUMA TREE PRESERVATION ORDINANCE (CHAPTER 17 IZO).
- IN ACCORDANCE WITH THE CITY OF PETALUMA TREE PRESERVATION ORDINANCE, ALL PROTECTED TREES THAT ARE REMOVED FROM THE SITE THAT ARE DETERMINED BY THE PROJECT ARBORIST TO BE IN GOOD (4) OR EXCELLENT (1) HEALTH, AND/OR WITH MODERATE (3) TO GOOD (4) STRUCTURE, WILL BE REPLACED ON A ONE-TO-ONE TRUNK DIAMETER BASIS. ALL PROTECTED TREES THAT ARE TO BE REMOVED FROM THE SITE, DETERMINED BY THE PROJECT ARBORIST TO HAVE FAIR (3) OR MARGINAL (2) HEALTH, AND/OR WITH MARGINAL (2) STRUCTURE, SHALL BE REPLACED ON A TWO-TO-ONE TRUNK DIAMETER BASIS.
- REPLACEMENT OF THE RED WILLOWS WILL PRIORITIZE MITIGATION WITHIN THE RIPARIAN CORRIDOR, ADJACENT TO THE SITE IF THERE IS ADEQUATE ROOM. WILLOWS GROW WITHIN THE CREEK AND THE INTENT WILL BE TO PROVIDE 1-2" WILLOW STAKES WHERE POSSIBLE WITHIN THE RIPARIAN CORRIDOR, USING BRANCHES FROM ARBOID WILLOWS. IF SPACE RUNS OUT THEN REMAINING MITIGATION OF THE WILLOWS WILL BE DONE USING THE WESTERN REDBUDS ON THE UPLAND PORTION OF THE SITE, ADJACENT TO THE CREEK.

INSPECTION OF PROTECTION & PRESERVATION MEASURES

- PRIOR TO MOBILIZATION OF CONSTRUCTION ARBORIST WILL MEET WITH THE CONTRACTOR TO REVIEW TREE PROTECTION/PRESERVATION MEASURES. DESIGNATE TREE REMOVALS, DELINEATE THE LOCATION OF TREE PROTECTION/NON-INTRUSION ZONE FENCING, SPECIFY EQUIPMENT ACCESS ROUTES AND MATERIALS STORAGE AREAS AND REVIEW EXISTING CONDITION OF TREES TO PROVIDE ANY ADDITIONAL NECESSARY RECOMMENDATIONS.
- AFTER INSTALLATION OF THE INZ FENCING, THE ARBORIST WILL INSPECT FOR ADEQUATE INSTALLATION OF TREE PROTECTION MEASURES, REVIEW ANY CONTRACTOR REQUEST FOR ACCESS, SOIL DISTURBANCE OR EXCAVATION AREAS WITHIN ROOT ZONES OF PROTECTED TREES. ASSESS ANY CHANGES IN THE HEALTH OF TREE SINCE LAST INSPECTION.
- DURING EXCAVATION/CONSTRUCTION ACTIVITIES NEAR THE TREES, ARBORIST WILL INSPECT ACTIVITY WITHIN THE NON-INTRUSION ZONES OF THE PRESERVED TREES AND ANY RECOMMENDATIONS IMPLEMENTED. ASSESS ANY CHANGES IN THE HEALTH OF TREE SINCE LAST INSPECTION.
- AT THE FINAL INSPECTION THE ARBORIST WILL INSPECT TREE HEALTH AND MAKE ANY NECESSARY RECOMMENDATIONS.

TREE PROTECTION NOTES

- BRIDGE CONSTRUCTION WILL BE DONE DURING THE DRY SEASON AND INCORPORATION OF SOME TEMPORARY FENCING WILL BE STRONGLY CONSIDERED FOR THE TREES WITHIN 50' OF THE BRIDGE ALIGNMENT SINCE THERE WILL BE SOME NEW EXPOSURE OF THE SUN TO AREAS OF THE RIPARIAN CORRIDOR FLOOR THAT HAVE BEEN OTHERWISE SHADDED. THIS IRRIGATION WOULD REMAIN THROUGHOUT THE DRY SEASON AND THE TREES WOULD BE MONITORED BY THE PROJECT ARBORIST AND BIOLOGIST TO DETERMINE WHEN THE IRRIGATION COULD BE REMOVED.
- AN URBAN FORESTER, CERTIFIED OR CONSULTING ARBORIST SHALL ESTABLISH THE TREE PROTECTION ZONE (TPZ) PRIOR TO STARTING THE DEMOLITION WORK. FOUR-FOOT-HIGH METAL WIRE CLOUTER FENCING WILL BE ERECTED BY THE CONTRACTOR AND INSPECTED BY THE ARBORIST TO LIMIT ACCESS TO THE TPZ. THIS WILL PROTECT THE TRUNK AND ROOT ZONE THROUGHOUT CONSTRUCTION.
- THE ARBORIST SHALL HAVE A PRE-DEMOLITION MEETING WITH CONTRACTOR OR RESPONSIBLE PARTY AND ALL OTHER FOREMEN OR CREW MANAGERS ON SITE PRIOR TO ANY WORK TO REVIEW ALL WORK PROCEDURES, ACCESS AND HAZIL ROUTES, AND TREE PROTECTION. THE CONTRACTOR MUST NOTIFY THE ARBORIST IF ROOTS ARE EXPOSED OR IF TRUNK OR BRANCHES ARE WOUNDED.
- ANY TRUNK AND ROOT CROWN THAT IS NOT PROTECTED BY A TPZ WHERE HEAVY EQUIPMENT OPERATION IS LIKELY TO WOUND OR TRUNK INSTALL A SHANKEL STAKE-LIKE TRUNK WRAP OF 2" X 4" STUDS CONNECTED TOGETHER WITH METAL STRAPS, ATTACHED TO THE 2" X 4" STUDS WITH DRIVER SCREWS OR 1" NAILS.
- PLYWOOD LAD OUT OVER THE RIPARIAN FLOOR WOULD BE CONSIDERED WHERE TREE PROTECTION ZONES CRITICAL ROOT ZONES EXIST AND WHERE EQUIPMENT MAY BE USED/STORED, TO HELP DISPERSE WEIGHT OF EQUIPMENT AND REDUCE SOIL EROSION AND ROOT COMPACTATION. AREAS WHERE SOIL IS EXPOSED MAY ALSO RECEIVE 3" DEEP OF ABSORB MULCH TO HELP RETAIN MOISTURE AND TO ALSO MITIGATE AGAINST SOIL COMPACTATION WITHIN THE TREE PROTECTION/CRITICAL ROOT PROTECTION ZONE.
- HEAVY EQUIPMENT USE SHOULD BE LIMITED AROUND TREES AND THE ROOTS. NO EQUIPMENT MAY BE TRANSPORTED OR USED ON BANK GROUND WITHIN THE TREE PROTECTION ZONE. ALL EQUIPMENT MUST BE PLACED UNDER THE PATH FOR ACCESS AND EGRESS. THE PROTECTIVE "SHIELD" SHALL BE MAINTAINED BY THE CONTRACTOR AND INSPECTED BY THE ARBORIST WHEN ON SITE.
- ANY DAMAGE TO TREES DUE TO DEMOLITION OR CONSTRUCTION ACTIVITIES SHALL BE REPORTED TO THE ARBORIST WITHIN 6 HOURS, SO THAT REMEDIAL ACTION CAN BE TAKEN.
- THE CONTRACTOR WILL HAVE TO USE THE LEAST IMPACTFUL METHOD OF EXCAVATION IF IN CLOSE PROXIMITY TO EXISTING TREE ROOTS. ALL TRENCHING WITHIN THE INZ SHALL BE DONE PRELIMINARILY OR BY HAND, BEING CAREFUL NOT TO DAMAGE ANY OF THE BANK OF ANY ROOT ENCOUNTERED.
- IF CONSTRUCTION CREATES A LOT OF DUST ON EXISTING VEGETATION IT WILL BE RECOMMENDED THAT THE CONTRACTOR WASH DOWN VEGETATION THAT HAS THICK LAYERS OF DUST.
- AN ARBORIST SHALL INSPECT ALL GRADING, TRENCHING, AND CONSTRUCTION ACTIVITIES WITHIN THE ROOT ZONES OF TREES PRIOR TO BACKFILL.
- NO CHEMICALS OR OTHER WASTE MATERIALS SHALL BE DUMPED WITHIN 20' OF THE BASE OF ANY TREE. THERE SHALL BE NO MATERIAL STORAGE IN THE INZ.
- ANY TREE PRUNING WILL BE DONE IN ACCORDANCE WITH THE LATEST VERSION OF ISA OR ANSI BEST MANAGEMENT PRACTICES/STANDARDS. ALL PRUNING WILL BE INSPECTED BY THE ARBORIST.
- THE ARBORIST MUST PERFORM A FINAL INSPECTION TO ENSURE THAT NO UNLIMITED DAMAGE HAS OCCURRED AND TO SPECIFY ANY PEST, DISEASE OR OTHER HEALTH CARE THAT THE ARBORIST SHALL ADVISE AND OVERSEE ANY NECESSARY RESTORATIVE ACTIONS.
- ANY SUSPECTED OMISSIONS OR CONFLICT BETWEEN VARIOUS ELEMENTS OF THE PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE ARBORIST AND RESOLVED BEFORE PROCEEDING WITH THE WORK.

Proposed Replacement Trees Quantity	Proposed Replacement Tree Species/Sizes
45	Proposed 24" box Oak or CA Buckeye Replacement Trees
26	2" diameter Red Willow stakes and/or 15 gal Western Red Bud
2	Proposed 15 gal Western Redbud Replacement Trees
73	Mitigation Trees
0	Remaining Replacement Trees Needed

- KEY NOTE
- LIMITS OF RIPARIAN TREE PRESERVATION AREA. SEE ARBORIST'S DETAILED DESCRIPTION OF THE TREE SPECIES AND RIPARIAN VEGETATION WITHIN THIS PROTECTED AND PRESERVED AREA.
 - DIAPHRANE OF ADJACENT NEIGHBOR TREES TO BE PROTECTED.
 - BERRY BRAMBLE DIAPHRANE
 - WILLOW DIAPHRANE (10'-20' ABOVE GRADE)
 - FIG DIAPHRANE (AT GRADE & UP TP 4' ABOVE GRADE)
 - LIVE OAK DIAPHRANE (2'-3' ABOVE GRADE)
 - REDWOOD DIAPHRANE (8'-20' ABOVE GRADE)
 - MAPLE DIAPHRANE (4' ABOVE GRADE)
 - LIVE OAK DIAPHRANE (8'-10' ABOVE GRADE)

PRELIMINARY TREE INVENTORY

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Action
1	Edible Fig	Ficus carica	7, 6.4, 6.2	5	Unprotected		Preserve and protect with fencing.
2	Apple	Malus domestica	4	4	Unprotected	Sun burn and associated necrosis on main trunk. In footprint of development.	Remove tree.
3	Plum	Prunus sp.	14.5	4	Unprotected	Near footprint of development.	Remove tree.
4	Flam tree	Prostrata sp.	11.5	3	Unprotected	Near footprint of development.	Remove tree.
5	English Walnut	Juglans regia	8.5, 7.5, 5.5	5	Unprotected	Near footprint of development.	Preserve and protect with fencing.
6	Edible Fig	Ficus carica	8, 6.5	5	Unprotected	Outside footprint of development.	Preserve and protect with fencing.
7	Edible Fig	Ficus carica	10	5	Unprotected	Outside footprint of development.	Preserve and protect with fencing.
8	Coast Redwood	Sequoia sempervirens	37	5	Protected	Outside footprint of development.	Preserve and protect with fencing.
9	Coast Redwood	Sequoia sempervirens	38	4	Protected	The tree bifurcates at approximately 25 feet above grade. The stems are codominant and there is bark pressed between the two stems. Outside footprint of development.	Preserve and protect with fencing.
10	Coast Redwood	Sequoia sempervirens	33	4	Protected	Outside footprint of development.	Preserve and protect with fencing.
11	Olive	Olea europaea	6, 6.4	5	Unprotected	In footprint of development.	Remove tree. To be transplanted onto designated remainder parcel.
12	English Walnut	Juglans regia	7	5	Unprotected	In footprint of development.	Remove tree. To be transplanted onto designated remainder parcel.
13	Sweetgum	Liquidambar styraciflua	14	4	Unprotected	In footprint of development.	Remove tree.
14	Photinia	Photinia fraxifolia	7.5, 4	4	Unprotected	In footprint of development.	Remove tree.
15	Crape Myrtle	Lagerstroemia sp.	6	4	Unprotected	In footprint of development.	Remove tree.
16	Riparian zone	Various native species		4	Protected	The riparian zone is populated with native tree and plant species. The predominant tree species are Willow (Salix sp.), Redwood (Sequoia sempervirens), Coast live oak (Quercus agrifolia), Toyon (Heteromeles arbutifolia). In general trees are in good health and the vast majority will not be impacted by development. Two natural locations (see map) will be installed within the riparian zone, which will require project arborist involvement.	Preserve and protect with fencing.
17	Row of English oak	Quercus robur 'hongkong'	4 to 12	5	Unprotected	Outside footprint of development. Small diameter limbs extend over property line.	Preserve. Existing fence is sufficient protection.
18	Coast live oak	Quercus agrifolia	19.5	5	Protected		Preserve and Protect with trunk armor.
19	Valley oak	Quercus lobata	7.5	4	Protected	Loggia.	Preserve and Protect with trunk armor.
20	Coast live oak	Quercus agrifolia	21.5	4	Protected		Preserve and protect. Consider building a pedestrian bridge on plans to span the root system of this tree and provide space for future growth.
21	Coast live oak	Quercus agrifolia	17	5	Protected		Preserve and protect with trunk armor.
22	Coast live oak	Quercus agrifolia	16, 6.5	5	Protected	Lean southeast.	Preserve and Protect with trunk armor.
23	Coast live oak	Quercus agrifolia	12.5	5	Protected	Trunk lean south.	Preserve and Protect with trunk armor.
24	Coast live oak	Quercus agrifolia	8.5, 7.5	3	Protected		Remove tree.
25	Valley oak	Quercus lobata	12.5	5	Protected		Remove tree.
26	Valley oak	Quercus lobata	9	4	Protected		Preserve and Protect with trunk armor.
27	Valley oak	Quercus lobata	8	5	Protected		Remove tree.
28	Valley oak	Quercus lobata	12.5	5	Protected		Preserve and Protect with trunk armor.
29	Valley oak	Quercus lobata	10	4	Protected		Remove tree.
30	California Buckeye	Aesculus californica	6, 6.4	4	Protected	Leans towards footprint of proposed bridge. May need to be pruned for bridge clearance.	Preserve and protect. Prune to create clearance for bridge.
31	Red willow	Salix laevigata	13.5, 10.5, 7.5	4	Protected	Smallest stem leans toward proposed bridge. This stem may have to be removed for bridge clearance.	Remove tree.
32	Oregon Ash	Fraxinus latifolia	7.5	5	Protected		Preserve and Protect.
33	Western Redbud	Juglans hindsii	6	5	Protected		Remove tree.
34	Oregon Ash	Fraxinus latifolia	6	5	Protected		Remove tree.
35	Red willow	Salix laevigata	8.5	4	Protected	Moderate amount of deadwood in canopy. Trunk leans north.	Preserve and Protect with trunk armor.
36	Red willow	Salix laevigata	9.5	1	Protected	Significant canopy dieback.	Remove tree.
37	Red willow	Salix laevigata	8	2	Protected		Remove tree.
38	Red willow	Salix laevigata	11	4	Protected	Moderate amount of deadwood in canopy.	Remove tree.
39	California Buckeye	Aesculus californica	6, 6.5	4	Protected	Low spreading canopy.	Remove tree.
40	Valley oak	Quercus lobata	15	5	Protected		Preserve and Protect with trunk armor.
41	Red willow	Salix laevigata	12.5	5	Protected		Preserve and Protect with trunk armor.
42	Red willow	Salix laevigata	13	4	Protected	Leans away from proposed path/bridge.	Preserve and Protect with trunk armor.
43	Coast live oak	Quercus agrifolia	23	5	Protected	Fill soil to be installed near this tree.	Preserve and Protect. Retain fill soil at least three feet from the base of this tree.
44	Red willow	Salix laevigata	17.5	2	Protected		Remove tree.
45	Valley oak	Quercus lobata	1.5	5	Protected		Remove tree.
46	Valley oak	Quercus lobata	1.5	4	Protected		Remove tree.
47	Red willow	Salix laevigata	3	2	Protected	Heavy leans over creek bank. Poorly anchored on bank.	Remove tree.
48	Red willow	Salix laevigata	3	4	Protected		Remove tree.
49	Red willow	Salix laevigata	3	2	Protected	Strong lean away from bridge alignment.	Remove tree.
50	Red willow	Salix laevigata	5, 3.5, 3	2	Protected	Poor health. Major deadwood in canopy.	Preserve and Protect.
51	Red willow	Salix laevigata	3.5	3	Protected	Poor form. Strong lean southeast away from bridge.	Remove tree.
52	California Buckeye	Aesculus californica	1.5	4	Protected		Remove tree.
53	Red willow	Salix laevigata	3	3	Protected	Leggy form and lean toward the bridge alignment.	Preserve and protect. Prune to create clearance for bridge.
54	California Buckeye	Aesculus californica	3.5	3	Protected	Lean northwest toward bridge alignment.	Remove tree.
55	California Buckeye	Aesculus californica	3.5	4	Protected	Lean away from the bridge. Support and intersected with adjacent trees.	Remove tree.
56	California Buckeye	Aesculus californica	3, 2.5, 2.5	4	Protected	Five stems total.	Remove tree.
57	California Buckeye	Aesculus californica	5, 2.5	2	Protected	Poor form. Large necrotic area on trunk.	Remove tree.
58	California Buckeye	Aesculus californica	2.5, 2.5, 1.5	4	Protected		Preserve and Protect.
59	Toyon	Heteromeles arbutifolia	3, 1.5	4	Protected	Growing through fence.	Remove tree.
60	Coast live oak	Quercus agrifolia	2.5	4	Protected?	Outside of creek and less than 4"	Outside of existing chainlink fence.
61	Coast live oak	Quercus agrifolia	2	4	Protected?	Outside of creek and less than 4"	Preserve and Protect.
62	Coast live oak	Quercus agrifolia	2.5, 1	4	Protected?	Outside of creek and less than 4"	Preserve and Protect.
63	California Buckeye	Aesculus californica	6	4	Protected		Trunk lean NW
64	California Buckeye	Aesculus californica	10 stems 4-8"	4	Protected		The tree is composed of approximately 10 stems all arising from ground level.
65	California Buckeye	Aesculus californica	6, 3	4	Protected		Trunk lean NE
66	California Buckeye	Aesculus californica	6, 3	4	Protected		Trunk lean NE
67	California Buckeye	Aesculus californica	6, 3	4	Protected		Trunk lean NE
68	California Buckeye	Aesculus californica	4	4	Protected		In footprint of drainage ditch as shown on plans but could potentially be preserved.
69	Coast live oak	Quercus agrifolia	4	4	Protected		South Storm drainage Outfall
70	Coast live oak	Quercus agrifolia	7	4	Protected		Tree has been regularly sheared over its life and has taken on a shrub form. The tree stands near the proposed pedestrian path. At least four feet of clearance should be provided between the trunk and path.
71	Fraxinus latifolia	Fraxinus latifolia	8.8, 7.6	4	Protected		Tree has been regularly sheared over its life and has taken on a shrub form. The tree stands near the proposed pedestrian path. At least four feet of clearance should be provided between the trunk and path.
72	Fraxinus latifolia	Fraxinus latifolia	8.8, 7.6	4	Protected		Tree has been regularly sheared over its life and has taken on a shrub form. The tree stands near the proposed pedestrian path. At least four feet of clearance should be provided between the trunk and path.

TREE INVENTORY NOTES:

- SEE THE GREEN DESCRIPTION BOXES IN TREE INVENTORY FOR PRUNING RECOMMENDATIONS.
- SEE TREE REPLACEMENT CALCULATIONS FOR MITIGATION
- = ANY EXISTING TREE DESIGNATED AS A PROTECTED SPECIES UNDER THE CITY OF PETALUMA IZO CHAPTER 17 TREE PRESERVATION

TREE CONDITION RATINGS

RATING CATEGORY	HEALTH	STRUCTURE	FORM
5	EXCELLENT	HIGH VIGOR AND NEARLY PERFECT HEALTH WITH LITTLE OR NO TWO DEFECTS OR DEFOLIATION	NEARLY IDEAL & FREE OF DEFECTS
4	GOOD	VIGOR IS NORMAL FOR SPECIES AND AGE. DEFECTS ARE NOT NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS MODERATE.	WELL-DEVELOPED AND NEARLY IDEAL. DEFECTS ARE MODERATE AND CAN BE CORRECTED.
3	FAIR	REDUCED VIGOR DUE TO INJURY OR DEFICIENCY. DEFECTS ARE MODERATE AND NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS MODERATE.	A SINGLE DEFECT OF A SIGNIFICANT NATURE OR DEFECTS ARE MODERATE AND NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS MODERATE.
2	POOR	UNHEALTHY OR Dying. DEFOLIATION IS SEVERE. DEFECTS ARE SEVERE AND NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS SEVERE.	A SINGLE SERIOUS DEFECT OF A SIGNIFICANT NATURE OR DEFECTS ARE SEVERE AND NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS SEVERE.
1	VERY POOR	POOR VIGOR. APPEARS TO BE DYING AND IN THE LAST STAGES OF LIFE. LITTLE LEAF FOLIAGE.	SINGLE OR MULTIPLE SEVERE DEFECTS ARE SEVERE AND NEARLY AS SEVERE AS THOSE OF A TREE IN THE NEXT CATEGORY. DEFOLIATION IS SEVERE.
DEAD			VISUALLY UNIMPELING. PROVIDES LITTLE OR NO FUNCTION IN THE LANDSCAPE.

TABLE 1. SOURCED FROM THE GUIDE FOR PLANT APPRAISAL, 10TH EDITION*

REVISIONS	BY

TREE REMOVAL, PRESERVATION & REPLACEMENT PLAN
CREEKWOOD CONDOMINIUM PROJECT
270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
PETALUMA, CALIFORNIA 94952

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
CIVIL ENGINEERS - LAND SURVEYORS
LAND PLANNERS - LANDSCAPE ARCHITECTS
PETALUMA THEATRE SQUARE
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3939

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TREE REMOVAL, PRESERVATION & REPLACEMENT PLAN - ENLARGED VIEW: PEDESTRIAN BRIDGE

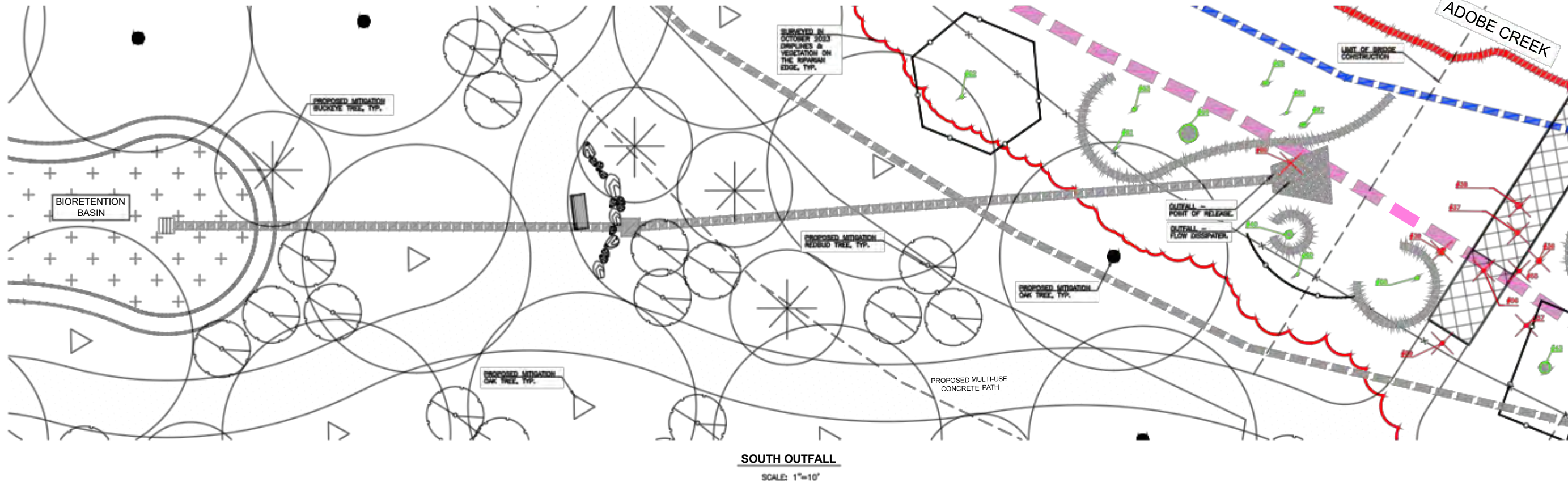
CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA



NOTES

1. FOR INFORMATION SUMMARY & THE RECOMMENDATION LOCATION, SEE SHEET 1-5.
2. SEE AMBROSIO REPORT BY LUNDA FOR SECURITY, DATED DECEMBER 2003 FOR MORE INFORMATION.
3. PROVIDE THE PROTECTION AT THE DIPLOMATS AS DETERMINED BY THE AMBROSIO IN THE FIELD. SEE PLAN FOR RECOMMENDED PROTECTION. THE PROTECTION OFFICER MAY BE ALLOCATED AS KEPTED FOR GENERAL COORDINATING ACCESS WITH DELEGATION OF PROTECTION. THE PROTECTION OFFICERS MAY BE APPLIED FOR THE AMBROSIO RECOMMENDATION. THERE WILL BE LIMITED COORDINATION ALLOWED WITHIN THE AMBROSIO FOR COORDINATION.

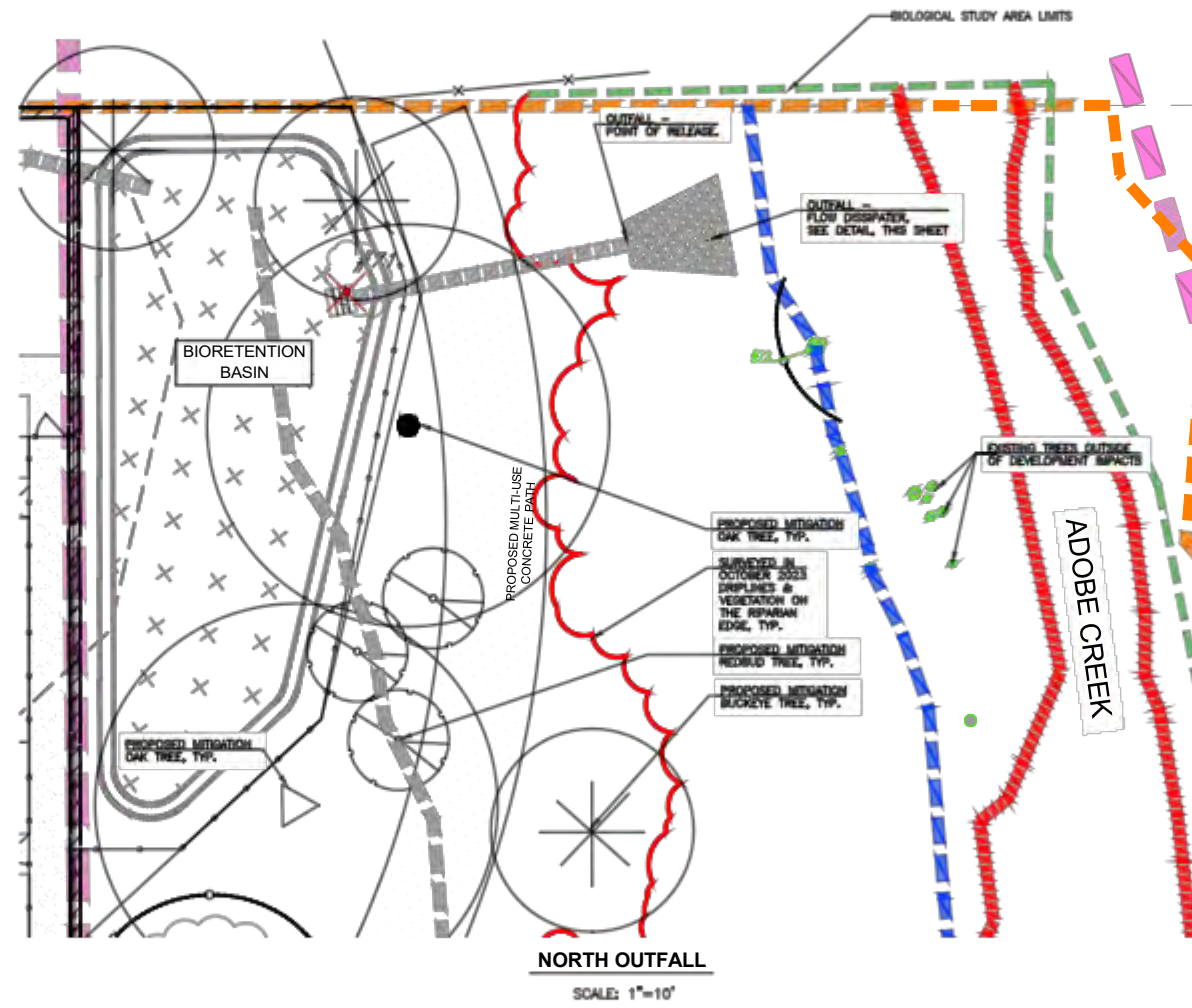




TREE INVENTORY - SOUTH OUTFALL LOCATION

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
36	Redwillow	<i>Salicacaspata</i>	0.5	1	Protected	Significant canopy dieback.	Remove tree.
37	Redwillow	<i>Salicacaspata</i>	8	3	Protected	Strong trunk lean southwest.	Remove tree.
38	Redwillow	<i>Salicacaspata</i>	11	4	Protected	Moderate amount of dieback in canopy.	Remove tree.
39	California Buckeye	<i>Amygdalus californica</i>	6, 6.5	4	Protected	Low spreading canopy.	Remove tree.
40	Valley oak	<i>Quercus lobata</i>	15	5	Protected		Preserve and Protect with trunk armor.
43	Coast live oak	<i>Quercus agrifolia</i>	23	5	Protected	Fill soil to be installed near this tree.	Preserve and Protect. Retain fill soil at least three feet from the trunk of this tree.
55	California Buckeye	<i>Amygdalus californica</i>	3.5	4	Protected	Lean away from the bridge. Suppressed and intertwined with adjacent trees.	Remove tree.
56	California Buckeye	<i>Amygdalus californica</i>	3, 2.5, 2.5	4	Protected	Flies stemrot.	Remove tree.
57	California Buckeye	<i>Amygdalus californica</i>	5, 2.5	3	Protected	Poor form. Large necrotic area on trunk.	Remove tree.
58	California Buckeye	<i>Amygdalus californica</i>	0.5, 2.5, 1.5	4	Protected		Preserve and Protect.
59	Turkey	<i>Metrosideros orbiculata</i>	3, 1.5	4	Protected	Feeding through fence.	Remove tree.
South Storm drainage Outfall							
60	Coast live oak	<i>Quercus agrifolia</i>	3.5	4	Protected?	Outside of creek and less than 4'	Preserve and Protect.
61	Coast live oak	<i>Quercus agrifolia</i>	2	4	Protected		Preserve and Protect.
62	Coast live oak	<i>Quercus agrifolia</i>	3.5, 1	4	Protected?	Outside of creek and less than 4'	Preserve and Protect.
63	California Buckeye	<i>Amygdalus californica</i>	6	4	Protected	Trunk lean NW	Preserve and Protect.
64	California Buckeye	<i>Amygdalus californica</i>	10 stems 6-10'	4	Protected	The tree is composed of approximately 10 stems all arising from ground level.	Preserve and Protect. Prune for drainage outfall clearance.
65	California Buckeye	<i>Amygdalus californica</i>	6, 3	4	Protected	Trunk lean NE	Preserve and Protect.
66	California Buckeye	<i>Amygdalus californica</i>	2	3	Protected	Trunk lean NE	Preserve and Protect.
67	California Buckeye	<i>Amygdalus californica</i>	6, 2	4	Protected	Trunk lean NE	Preserve and Protect.
68	California Buckeye	<i>Amygdalus californica</i>	4	4	Protected	In footprint of drainage outfall as shown on plans but could potentially be preserved.	Remove tree.

TREE INVENTORY NOTE:
SEE THE GREEN DESCRIPTION BOXES IN TREE INVENTORY FOR PRUNING RECOMMENDATIONS.

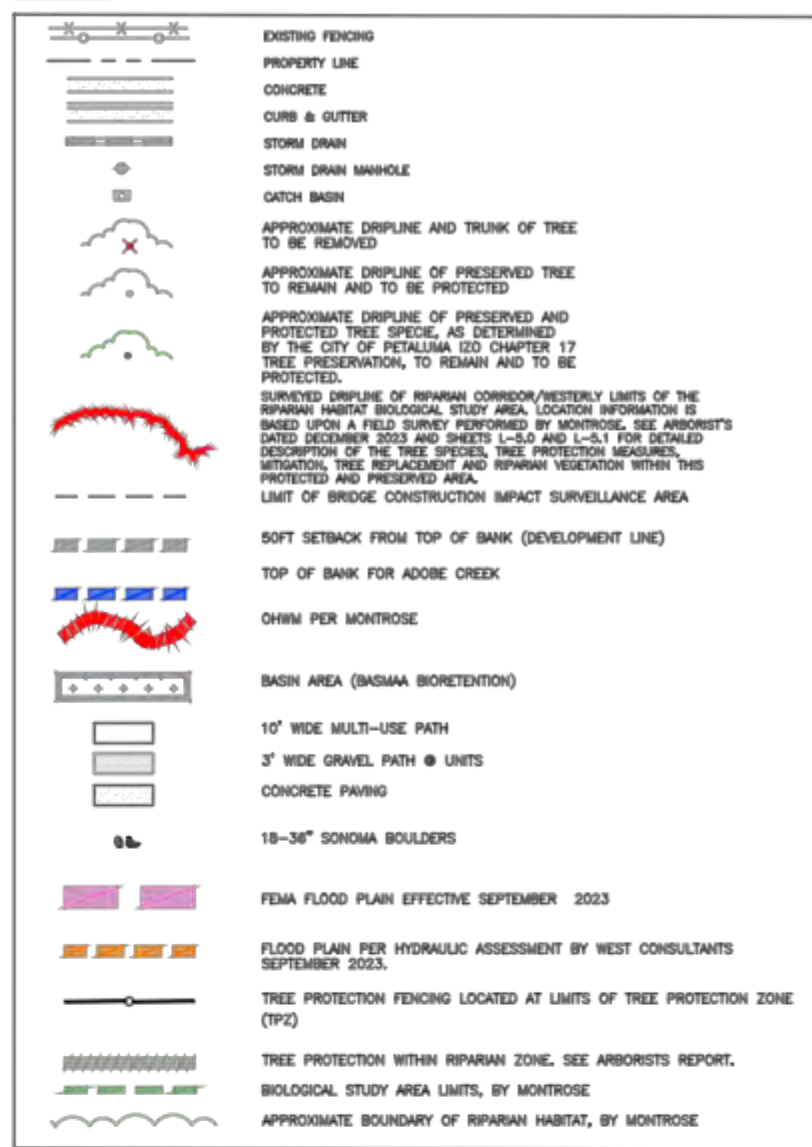


TREE INVENTORY - NORTH OUTFALL LOCATION

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
71	Treeing poplar	<i>Populus spp.</i>	2	4	Unprotected	Leaves over head.	Remove tree.
72	Oregon Ash	<i>Fraxinus latifolia</i>	8, 8, 4, 6	4	Protected	The tree is on the stream bank outside the existing wire fence.	Preserve and Protect. Prune to retain canopy over outfall construction footprint.

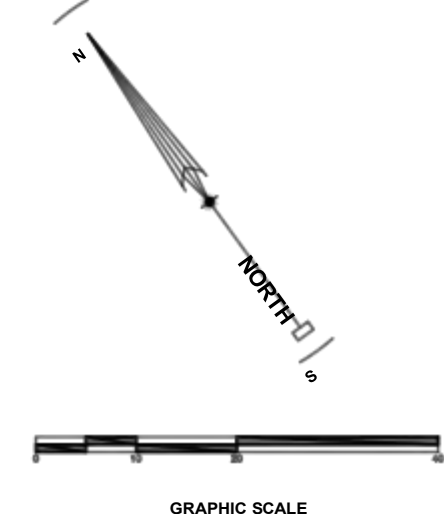
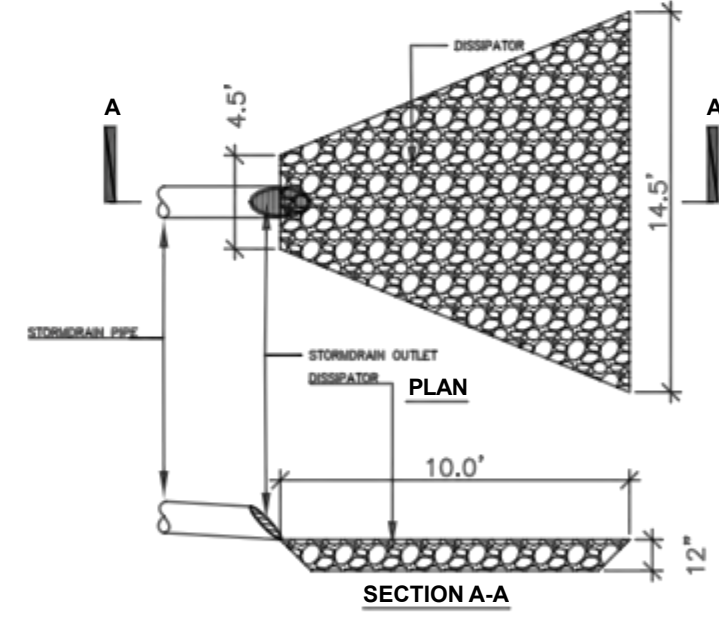
TREE INVENTORY NOTE: TREE INVENTORY FOR PRUNING RECOMMENDATIONS.

LEGEND



NOTES

- FOR MITIGATION SUMMARY & TREE REPLACEMENT LOCATION, SEE SHEET L-5.
- SEE ARBORIST REPORT BY URBAN FORESTRY, DATED DECEMBER 2023 FOR MORE INFORMATION.
- PROVIDE TREE PROTECTION AT THE DIELINES AS DETERMINED BY THE ARBORIST IN THE FIELD. SEE PLAN FOR RECOMMENDED PROTECTION MEASURES. TREE PROTECTION MAY BE ADJUSTED AS NEEDED FOR CERTAIN CONSTRUCTION ACCESS WITH OVERSIGHT OF THE MONITORING ARBORIST. ADDITIONAL TREE PROTECTION MEASURES MAY BE APPLIED FOR THE ARBORIST RECOMMENDATIONS. THERE WILL BE LIMITED CONSTRUCTION ALLOWED WITHIN THE BRIDGE SPAN FOOTPRINT.





**Creekwood Development
Tree Protection and Removal Plan**

Prepared for:
Doyle Heaton
DRG Builders Inc.

Prepared by:
Zach Vought
Urban Forestry Associates Inc.
209 San Anselmo Ave., San Anselmo, CA 94901

December 19, 2023

December 19, 2023

Mr. Doyle Heaton,

Enclosed is a report of my findings regarding trees within/near the Creekwood development project at 270 & 280 Casa Grande Road in Petaluma. The project proposes demolishing one of the two existing homes on site and constructing a new subdivision and a pedestrian bridge across Adobe Creek. This report describes the current health and condition of the trees, documents trees scheduled for removal, and provides tree preservation guidelines and specific comments on tree protection measures. Please note there is a supplementary map to accompany this report. The map indicates tree locations, trees slated for removal, and tree protection fencing locations. See SPAR Landscape Plan sheet L-5, L-5.1 & L-5.2, Tree Removal, Protection, and Replacement Plan.

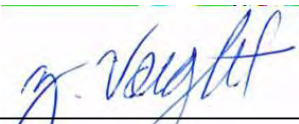
I conducted a site visit on March 4 and October 14, 2021, April 6, 2022, and May 17 & October 25, 2023, to evaluate trees in the development area, along the riparian zone near Adobe Creek, and trees on adjacent properties with driplines extending into the project area. Tree cover in the main development area is sparse. Most trees are small, non-native ornamental varieties. The riparian zone contains a mixture of native tree and plant species, most of which are healthy. The latest fieldwork involved a more involved survey of trees one inch in diameter or larger near the proposed pedestrian bridge that crosses Adobe Creek and proposed outfall locations. Fencing installation to establish tree protection zones will comprise the bulk of tree protection measures.

Seventy-two (72) trees were included in the assessment. I inventoried trees within a 25-foot radius of the bridge alignment. "Tree 17" is a row of oak trees growing at 400 Casa Grande Rd. The trees are offsite, but some canopies extend over the property line. Trees 18-72 grow in or near the creek near the proposed bridge and storm drainage outfalls.

Thirty one (31) trees are scheduled for removal for the project, Twenty-four (24) of which are native and require replacement. A comprehensive tree replacement plan is provided in this report.

Please let me know if you have questions regarding the contents of this report.

Regards,



Zachary Vought, Urban Forester
Registered Consulting Arborist #691
ISA Board Certified Master Arborist WE-9995B
ISA Qualified Tree Risk Assessor

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ASSIGNMENT/ PURPOSE

DRG Builders Inc. asked me to evaluate trees on two parcels (017-040-016 and 017-040-051) as a part of the proposed Creekwood housing development project in Petaluma. The purpose of my assessment and this report is to document the species and condition of the trees onsite, provide protection measures for leaving trees, and provide a list of trees scheduled for removal. Sheets L-5, L-5.1 & L-5.2, the Tree Removal and Protection and Replacement Plan, is to accompany this report and include tree and fencing locations.

SUMMARY

The project proposes to remove thirty-one (31) trees. Twenty-four (24) trees scheduled for removal qualify as protected per the Petaluma Tree Ordinance. The remaining 41 trees are to be preserved and protected.

The Tree Impact Summary on Pages 6 & 7 lists trees scheduled to be removed or pruned.

METHODOLOGY

Per Section 17.070 of the Petaluma Municipal Code, I evaluated trees in/near the development area with a dbh¹ measuring four inches or larger and identified with metal numbered tags corresponding to the inventory. My assessment includes trees one inch in diameter or larger in the creek near the proposed pedestrian bridge and storm drainage outfalls. I conducted a cursory evaluation of the riparian zone along the eastern property boundary and the north property line near a row of English oak trees. Tree health, structure, and form were assessed and adapted to conform with a numerical rating system that combines those ratings into a single condition rating. Condition ratings were evaluated on a scale of 1-5, 1 being poor and 5 being good conditions.

SITE

The project site is on two adjacent parcels, which are relatively flat. Tree cover in the development footprint is sparse and composed of primarily small non-native ornamental species and fruit trees. The Casa Grande Senior Apartments stands north of the project site. A row of established English oak (*Quercus robur* 'Fastigiata') trees is on the senior living property. There are two existing homes onsite. I understand the home and vegetation at 280 Casa Grande Rd. will be demolished. Most of the trees in the inventory are at 270 Casa Grande Rd. The Malnati home at 270 Casa Grande Rd. will be preserved. The largest trees on site are mature Coast redwood (*Sequoia sempervirens*), all of which will be preserved and are well outside the development area. Along Adobe Creek to the east is a riparian zone composed of native trees and vegetation. The native tree species include Willow (*Salix spp.*); Buckeye (*Aesculus californica*); Coast live oak (*Quercus agrifolia*); Valley oak (*Quercus lobata*); Oregon ash (*Fraxinus latifolia*) and Toyon (*Heteromeles arbutifolia*). Generally, the riparian area's trees exhibit good health and are well outside the development zone.

SPECIFIC AREAS OF CONCERN

Storm drain outfalls

Two storm drain outfalls are proposed in/near the riparian zone, one near the property's northeast portion and another at the southeast corner. The location of these outfalls has been tentatively determined, and trees near the outfalls were located and identified in the tree inventory. One tree is scheduled for removal to accommodate the southern SD outfall. If excavation is required, ideally, it will be performed by hand when it occurs within ten feet of any tree. If the use of heavy equipment is necessary, mitigation measures should be employed to minimize soil compaction/damage to tree trunks. Additional fencing or trunk protection may be required in these areas when the work is being performed.

¹ Trunk diameter measured at 4.5' above grade.

English oak trees

During my assessment, the row of oaks on the senior living property was in leaf-off condition. However, the trees appear to be in good health and structural condition. An existing fence separates this row of trees from the project area. Only small branches from these trees extend over the property line, which may require some minor pruning for the project, but nothing significant. Mostly, these trees are not expected to be negatively impacted by development. This cultivar of English oak has an upright/columnar form and can be pruned to maintain clearance from structures over the long term.

Pedestrian Bridge

Twenty-three (23) trees near the bridge will be removed. The remaining trees in this area will be preserved and protected. Pruning will be necessary for a few of the preserved trees in this area. The project arborist should meet with the contractor before bridge construction to discuss the potential for additional pruning to minimize the chances of tree damage, especially if a crane is used. Generally, the bridge and pedestrian paths proposed in this area are expected to have a low impact on the trees. Tree 49 is a small red willow scheduled to be preserved. It is very close to the bridge alignment but leans heavily away from the bridge and is growing near ground level, so there is a good chance it can be preserved.

Tree Protection Zones

The tree protection zones (TPZ) indicated on the L-5 map were determined by the trees' trunk diameter, canopy spread and distribution, topography around the tree, and access needs. It is not a work exclusion zone, but a zone where the roots must be protected from soil compaction and grading. Installation of fencing where the bridge is proposed may be difficult unless significant brush clearance is performed. At a minimum, the trunks of trees near construction areas should be protected with 2x4s strapped to the trunk. Heavy equipment usage should be limited as much as possible within ten feet of any tree. Wood chip mulch may be used where equipment is expected to mitigate soil compaction.

Trees located within the riparian zone will be protected using yellow rope strung between posts to create the non-intrusion zone (NIZ). The NIZ shall be defined by the project arborist prior to construction. Construction activities and foot traffic are not permitted in the NIZ without the oversight of the project arborist.

Please see sheets L-5, L-5.1 & L-5.2 for the location and type of tree protection (See Page 22 for fencing specifications).

Mulch

Wood chips may be installed to a depth of 3 inches within the tree protection fencing area to promote tree health, but not directly against the trunk.

Replacement Trees (See Page 19-21)

Mitigation for the trees removed within the area will conform to the City of Petaluma Tree Preservation Ordinance (Chapter 17 IZO). The mitigation ratio for healthy trees will be at a 1:1 ratio, and trees with poor health scores of 2 or less will be replaced at 2:1. The Mitigation will intend to replace the removed trees with an in-kind native species. Willows to be removed will either be replaced with another willow or Western redbud. Replacement of the red willow will prioritize Mitigation within the riparian corridor adjacent to the site if there is adequate room. Willows grow within the creek, and the intent will be to provide 1-2" willow stakes where possible within the riparian corridor, using branches from existing willows, if possible. Red willow is a fast-growing, short-lived, and decay-prone species, so it should not be planted adjacent to the bridge alignment due to potential safety concerns. Arroyo willow is a better option as it tends to stay smaller and more manageable compared to red willow. If space runs out, the remaining will be Mitigation of the willows using the Western Redbuds on the upland portion of the site adjacent to the creek. All other trees to be mitigated will be replaced using native oaks and California buckeye within the upland areas adjacent to the creek.

TREE IMPACT SUMMARY

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status
Trees to be removed <u>outside</u> riparian habitat preservation area					
2	Apple	<i>Malus domestica</i>	6	4	Unprotected
3	Plum sp.	<i>Prunus sp.</i>	14.5	4	Unprotected
4	Plum sp.	<i>Prunus sp.</i>	11.5	3	Unprotected
13	Sweetgum	<i>Liquidambar styraciflua</i>	14	4	Unprotected
14	Photinia	<i>Photinia fraseri</i>	7, 5, 4	4	Unprotected
15	Crape Myrtle	<i>Lagerstroemia sp.</i>	6	4	Unprotected
71	Fruiting pear	<i>Pyrus spp.</i>	3	2	Unprotected
Trees to be removed <u>in</u> the riparian habitat preservation area					
24	Coast live oak	<i>Quercus agrifolia</i>	8.5, 7.5	5	Protected
25	Coast live oak	<i>Quercus agrifolia</i>	12.5	5	Protected
27	Valley oak	<i>Quercus lobata</i>	6	5	Protected
29	Valley oak	<i>Quercus lobata</i>	10	4	Protected
33	Northern CA. walnut	<i>Juglans hindsii</i>	6	5	Protected
34	Oregon Ash	<i>Fraxinus latifolia</i>	6	5	Protected
36	red willow	<i>Salix laevigata</i>	9.5	1	Protected
37	red willow	<i>Salix laevigata</i>	8	3	Protected
38	red willow	<i>Salix laevigata</i>	11	4	Protected
39	California Buckeye	<i>Aesculus californica</i>	6, 6, 5	4	Protected
44	red willow	<i>Salix laevigata</i>	17.5	2	Protected
45	valley oak	<i>Quercus lobata</i>	7	5	Protected
46	Oregon Ash	<i>Fraxinus latifolia</i>	1.5	4	Protected
47	red willow	<i>Salix laevigata</i>	3	2	Protected
48	red willow	<i>Salix laevigata</i>	3	4	Protected
50	red willow	<i>Salix laevigata</i>	5, 3.5, 3	2	Protected
51	red willow	<i>Salix laevigata</i>	3.5	3	Protected
52	California Buckeye	<i>Aesculus californica</i>	1.5	4	Protected
54	red willow	<i>Salix laevigata</i>	3	3	Protected
55	California Buckeye	<i>Aesculus californica</i>	3.5	4	Protected
56	California Buckeye	<i>Aesculus californica</i>	3, 2.5, 2.5	4	Protected

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status
57	California Buckeye	<i>Aesculus californica</i>	5, 2.5	2	Protected
59	Toyon	<i>Heteromeles arbutifolia</i>	3, 1.5	4	Protected
68	California Buckeye	<i>Aesculus californica</i>	4	4	Protected
Trees scheduled for pruning					
30	California Buckeye	<i>Aesculus californica</i>	6, 6, 4	4	Protected
31	red willow	<i>Salix laevigata</i>	13.5, 10.5, 7.5	4	Protected
53	red willow	<i>Salix laevigata</i>	3	3	Protected
64	California Buckeye	<i>Aesculus californica</i>	10 stems 4-8"	4	Protected
72	Oregon Ash	<i>Fraxinus latifolia</i>	8, 8, 7, 6	4	Protected

INSPECTION SCHEDULE

Inspection of site: Prior to Equipment and Materials Move In, Site Work, Demolition and Tree Removal: The Project Arborist will meet with the General Contractor, Architect / Engineer, and Owner or their representative to review tree preservation measures, designate tree removals, delineate the location of tree protection / non-intrusion zone fencing, specify equipment access routes and materials storage areas, review the existing condition of trees and provide any necessary recommendations.

Inspection of site: After installation of NIZ fencing: Inspect site for the adequate installation of tree preservation measures. Review any requests by contractor for access, soil disturbance or excavation areas within root zones of protected trees. Assess any changes in the health of trees since last inspection.

Inspection of site: During excavation or any activities that could affect trees: Inspect site during any activity within the Non-Intrusion Zones of preserved trees and any recommendations implemented. Assess any changes in the health of trees since last inspection.

Final Inspection of Site: Inspection of site following completion of construction: Inspect for tree health and make any necessary recommendations.

SCOPE OF WORK / LIMITATIONS

Information regarding property boundaries, land ownership, and tree ownership was evident from a land survey and/or property fencing provided by the client. UFA has no personal or monetary interest in the outcome of this matter. All determinations reflected in this report are objective and to the best of our ability. All observations regarding the sites and trees were made by UFA personnel, independently, based on our education and experience. Determinations of the health and hazard potential of the subject trees are through visual inspection only and of our best professional judgment.

The health and hazard assessments in this report are limited by the visual nature of the assessment. Defects may be obscured by soil, brush, vines, aerial foliage, branches, multiple trunks or other trees. None of the subject trees were examined using invasive techniques such as increment coring or Resistograph® tests. The probability of tree failure is dependent on a number of factors including topography, geology, soil characteristics, wind patterns, species characteristics (both visually evident and concealed), structural defects, and the characteristics of a specific storm. Structurally sound, healthy trees fail during severe storms. Consequently, a conclusion that a tree does not require corrective surgery or removal is not a guarantee of no risk, hazard, or sound health.

TREE WORK STANDARDS AND QUALIFICATION

All tree work, removal, pruning, and planting, shall be performed using industry standards as established by the International Society of Arboriculture. Contractors must have a State of California Contractors License for Tree Service (C61-D49) or Landscaping (C-27) with general liability, worker's compensation, and commercial auto/equipment insurance.

Contractor standards of workmanship shall adhere to current Best Management Practices of the International Society of Arboriculture (ISA) and the American National Standards Institute (ANSI) for tree pruning, fertilization and safety (ANSI A300 and Z133.1).

ARBORIST'S CHECKLIST

- An urban forester, certified or consulting Arborist shall establish the Tree Protection Zone (TPZ) prior to starting the demolition work. Four-foot-high metal wire deer fencing and/or yellow ropes supported by posts will be erected by the contractor and inspected by the Arborist to limit access to the TPZ. This will protect the trunk and root zone throughout construction.
- The Arborist shall have a pre-demolition meeting with the contractor or responsible party and all other foremen or crew managers on site prior to any work to review all work procedures, access and haul routes, and tree protection. The contractor must notify the Arborist if roots are exposed or if trunk or branches are wounded.
- Any trunk and root crown that is not protected by a TPZ where heavy equipment operation is likely to wound the trunk, install a barrel stave-like trunk wrap out of 2 X 4 studs connected together with metal straps, attached to the 2 X 4's with driver screws or 1" nails.
- Storage of equipment shall be as far away from protected trees as possible and optimally on asphalt or ground covered by mulch/plywood.
- Heavy equipment use should be limited around trees and roots. No equipment within the root zone may be transported or used on bare ground. A 3" layer of mulch and plywood must be placed under the path for access and egress. The protective "bridge" shall be maintained by the contractor and inspected by the Arborist when on site.
- Any damage to trees due to demolition or construction activities shall be reported to the Arborist within 6 hours, so that remedial action can be taken.
- The project arborist shall oversee any trenching within 10 feet of any tree. Any trenching within the Non-intrusion zone (NIZ) shall be done pneumatically or by hand, being careful not to damage any of the bark of any root encountered.
- An arborist shall inspect all grading, trenching, tunneling or other excavation within the root zones of trees prior to backfill.
- No chemicals or other waste materials shall be dumped within 20' of the base of any tree. There shall be no material storage in the NIZ.
- Any tree pruning will be done in accordance with the latest version of ISA or ANSI best management practices/ standards. All pruning will be inspected by the Arborist.
- The Arborist must perform a final inspection to ensure no unmitigated damage and specify any pest, disease or other health care. The Arborist shall specify and oversee any necessary restorative actions.
- Any suspected omissions or conflict between various elements of the plan shall be brought to the attention of the Arborist and resolved before proceeding with the work.

SOURCES

- Field data collected by Urban Forestry Associates on 3/4/21; 10/14/21; 4/6/22; 5/17/23.
- Site plan and site survey provided by Steven J Lafranchi & Associates Inc.

Rating category	Condition components		
	Health	Structure	Form
Excellent 5	High vigor and nearly perfect health with little or no twig dieback, discoloration, or defoliation	Nearly ideal and free of defects.	Nearly ideal for the species. Generally symmetric. Consistent with the intended use.
Good 4	Vigor is normal for the species. No significant damage due to diseases or pests. Any twig dieback, defoliation, or discoloration is minor.	Well-developed structure. Defects are minor and can be corrected.	Minor asymmetries/deviations from species norm. Mostly consistent with the intended use. Function and aesthetics are not compromised.
Fair 3	Reduced vigor. Damage due to insects or diseases may be significant and associated with defoliation but is not likely to be fatal. Twig dieback, defoliation, discoloration, and/or dead branches may comprise up to 50% of the crown.	A single defect of a significant nature or multiple moderate defects. Defects are not practical to correct or would require multiple treatments over several years.	Major asymmetries/deviations from species norm and/or intended use. Function and/or aesthetics are compromised.
Poor 2	Unhealthy and declining in appearance. Poor vigor. Low foliage density and poor foliage color are present. Potentially fatal pest infestation. Extensive twig and/or branch dieback.	A single serious defect or multiple significant defects. Recent change in tree orientation. Observed structural problems cannot be corrected. Failure may occur at any time.	Largely asymmetric/abnormal. Detracts from intended use and/or aesthetics to a significant degree.
Very poor 1	Poor vigor. Appears to be dying and in the last stages of life. Little live foliage.	Single or multiple severe defects. Failure is probable or imminent.	Visually unappealing. Provides little or no function in the landscape.
Dead			

Table 1. Tree Condition Ratings Sourced from The Guide for Plant Appraisal, 10th Edition

Table 2. Tree Inventory

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
1	Edible Fig	<i>Ficus carica</i>	7, 6.4, 6.2	5	Unprotected		Preserve and protect with fencing.
2	Apple	<i>Malus domestica</i>	6	4	Unprotected	Sun burn and associated necrosis on main trunk. In footprint of development.	Remove tree.
3	Plum sp.	<i>Prunus sp.</i>	14.5	4	Unprotected	Near footprint of development.	Remove tree.
4	Plum sp.	<i>Prunus sp.</i>	11.5	3	Unprotected	Near footprint of development.	Remove tree.
5	English Walnut	<i>Juglans regia</i>	8.5, 7.5, 5.5	5	Unprotected	Near footprint of development.	Preserve and protect with fencing.
6	Edible Fig	<i>Ficus carica</i>	8, 6.5	5	Unprotected	Outside footprint of development.	Preserve and protect with fencing.
7	Edible Fig	<i>Ficus carica</i>	10	5	Unprotected	Outside footprint of development.	Preserve and protect with fencing.
8	Coast Redwood	<i>Sequoia sempervirens</i>	37	5	Protected	Outside footprint of development.	Preserve and protect with fencing.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
9	Coast Redwood	<i>Sequoia sempervirens</i>	38	4	Protected	The tree bifurcates at approximately 25 feet above grade. The stems are codominant and there is bark pressed between the two stems. Outside footprint of development.	Preserve and protect with fencing.
10	Coast Redwood	<i>Sequoia sempervirens</i>	33	4	Protected	Outside footprint of development.	Preserve and protect with fencing.
11	Olive	<i>Olea europaea</i>	6, 6, 4	5	Unprotected	In footprint of development.	Remove tree. To be transplanted onto designated remainder parcel.
12	English Walnut	<i>Juglans regia</i>	7	5	Unprotected	In footprint of development.	Remove tree. To be transplanted onto designated remainder parcel.
13	Sweetgum	<i>Liquidambar styraciflua</i>	14	4	Unprotected	In footprint of development.	Remove tree.
14	Photinia	<i>Photinia fraseri</i>	7, 5, 4	4	Unprotected	In footprint of development.	Remove tree.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
15	Crape Myrtle	<i>Lagerstroemia sp.</i>	6	4	Unprotected	In footprint of development.	Remove tree.
16	Riparian zone	Various native species		4	Protected	The riparian zone is populated with native tree and plant species. The predominant tree species are: Willow (<i>Salix spp.</i>); Buckeye (<i>Aesculus californica</i>); Coast live oak (<i>Quercus agrifolia</i>); Toyon (<i>Heteromeles arbutifolia</i>). In general trees are in good health and the vast majority will not be impacted by development. Two outfall locations (See map) will be installed within the riparian zone, which will require project arborist involvement.	Preserve and protect with fencing.
17	Row of Upright English oaks	<i>Quercus robur 'Fastigiata'</i>	4 to 12	5	Unprotected	Outside footprint of development. Small diameter limbs extend over property line.	Preserve. Existing fence is sufficient protection.
18	Coast live oak	<i>Quercus agrifolia</i>	19.5	5	Protected		Preserve and Protect with trunk armor.
19	Valley oak	<i>Quercus lobata</i>	7.5	4	Protected	Leggy.	Preserve and Protect with trunk armor.
20	Coast live oak	<i>Quercus agrifolia</i>	21.5	4	Protected		Preserve and protect. Consider building a pedestrian bridge on piers to span the root system of this tree and provide space for future growth.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
21	Coast live oak	<i>Quercus agrifolia</i>	17	5	Protected		Preserve and protect with fencing.
22	Coast live oak	<i>Quercus agrifolia</i>	16, 6.5	5	Protected	Lean southeast.	Preserve and Protect with trunk armor.
23	Coast live oak	<i>Quercus agrifolia</i>	12.5	5	Protected	Trunk lean south.	Preserve and Protect with trunk armor.
24	Coast live oak	<i>Quercus agrifolia</i>	8.5, 7.5	5	Protected		Remove tree.
25	Coast live oak	<i>Quercus agrifolia</i>	12.5	5	Protected		Remove tree.
26	Valley oak	<i>Quercus lobata</i>	9	4	Protected		Preserve and Protect with trunk armor.
27	Valley oak	<i>Quercus lobata</i>	6	5	Protected		Remove tree.
28	Coast live oak	<i>Quercus agrifolia</i>	12.5	5	Protected		Preserve and Protect with trunk armor.
29	Valley oak	<i>Quercus lobata</i>	10	4	Protected		Remove tree.
30	California Buckeye	<i>Aesculus californica</i>	6, 6, 4	4	Protected	Leans towards footprint of proposed bridge. May need to be pruned for bridge clearance.	Preserve and protect. Prune to create clearance for bridge.
31	red willow	<i>Salix laevigata</i>	13.5, 10.5, 7.5	4	Protected	Smallest stem leans toward proposed bridge. This stem may have to be removed for bridge clearance.	Preserve and protect. Prune to create clearance for bridge.
32	Oregon Ash	<i>Fraxinus latifolia</i>	7.5	5	Protected		Preserve and Protect.
33	Northern CA. walnut	<i>Juglans hindsii</i>	6	5	Protected		Remove tree.
34	Oregon Ash	<i>Fraxinus latifolia</i>	6	5	Protected		Remove tree.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
35	red willow	<i>Salix laevigata</i>	8.5	4	Protected	Moderate amount of deadwood in canopy. Trunk leans north.	Preserve and Protect with trunk armor.
36	red willow	<i>Salix laevigata</i>	9.5	1	Protected	Significant canopy dieback.	Remove tree.
37	red willow	<i>Salix laevigata</i>	8	3	Protected	Strong trunk lean southwest.	Remove tree.
38	red willow	<i>Salix laevigata</i>	11	4	Protected	Moderate amount of deadwood in canopy.	Remove tree.
39	California Buckeye	<i>Aesculus californica</i>	6, 6, 5	4	Protected	Low spreading canopy.	Remove tree.
40	Valley oak	<i>Quercus lobata</i>	15	5	Protected		Preserve and Protect with trunk armor.
41	red willow	<i>Salix laevigata</i>	12.5	5	Protected		Preserve and Protect with trunk armor.
42	red willow	<i>Salix laevigata</i>	13	4	Protected	Leans away from proposed path/bridge.	Preserve and Protect with trunk armor.
43	Coast live oak	<i>Quercus agrifolia</i>	23	5	Protected	Fill soil to be installed near this tree.	Preserve and Protect. Retain fill soil at least three feet from the trunk of this tree.
44	red willow	<i>Salix laevigata</i>	17.5	2	Protected		Remove tree.
45	valley oak	<i>Quercus lobata</i>	7	5	Protected		Remove tree.
46	Oregon Ash	<i>Fraxinus latifolia</i>	1.5	4	Protected		Remove tree.
47	red willow	<i>Salix laevigata</i>	3	2	Protected	Heavy lean over creek bank. Poorly anchored on bank.	Remove tree.
48	red willow	<i>Salix laevigata</i>	3	4	Protected		Remove tree.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
49	red willow	<i>Salix laevigata</i>	4	3	Protected	Strong lean away from bridge alignment.	Preserve and Protect.
50	red willow	<i>Salix laevigata</i>	5, 3.5, 3	2	Protected	Poor health. Major deadwood in the canopy.	Remove tree.
51	red willow	<i>Salix laevigata</i>	3.5	3	Protected	Poor form. Strong lean southeast away from bridge.	Remove tree.
52	California Buckeye	<i>Aesculus californica</i>	1.5	4	Protected		Remove tree.
53	red willow	<i>Salix laevigata</i>	3	3	Protected	Leggy form and lean toward the bridge alignment.	Preserve and protect. Prune to create clearance for bridge.
54	red willow	<i>Salix laevigata</i>	3	3	Protected	Lean northwest toward bridge alignment.	Remove tree.
55	California Buckeye	<i>Aesculus californica</i>	3.5	4	Protected	Lean away from the bridge. Suppressed and intertwined with adjacent trees.	Remove tree.
56	California Buckeye	<i>Aesculus californica</i>	3, 2.5, 2.5	4	Protected	Five stems total.	Remove tree.
57	California Buckeye	<i>Aesculus californica</i>	5, 2.5	2	Protected	Poor form. Large necrotic area on trunk.	Remove tree.
58	California Buckeye	<i>Aesculus californica</i>	2.5, 2.5, 1.5	4	Protected		Preserve and Protect.
59	Toyon	<i>Heteromeles arbutifolia</i>	3, 1.5	4	Protected	Growing through fence.	Remove tree.
South Storm Drainage outfall							
60	Coast live oak	<i>Quercus agrifolia</i>	2.5	4	Unprotected. Outside of the creek and less than 4".	Outside of existing chainlink fence.	Preserve and Protect.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
61	Coast live oak	<i>Quercus agrifolia</i>	2	4	Protected		Preserve and Protect.
62	Coast live oak	<i>Quercus agrifolia</i>	2.5, 1	4	Unprotected. Outside of the creek and less than 4".	Outside of existing chainlink fence.	Preserve and Protect.
63	California Buckeye	<i>Aesculus californica</i>	6	4	Protected	Trunk lean NW	Preserve and Protect.
64	California Buckeye	<i>Aesculus californica</i>	10 stems 4-8"	4	Protected	The tree is composed of approximately 10 stems all arising from ground level.	Preserve and Protect. Prune for drainage outfall clearance.
65	California Buckeye	<i>Aesculus californica</i>	6, 3	4	Protected	Trunk lean NE	Preserve and Protect.
66	California Buckeye	<i>Aesculus californica</i>	2	3	Protected	Trunk lean NE	Preserve and Protect.
67	California Buckeye	<i>Aesculus californica</i>	6, 3	4	Protected	Trunk lean NE	Preserve and Protect.
68	California Buckeye	<i>Aesculus californica</i>	4	4	Protected	In footprint of drainage outfall as shown on plans but could potentially be preserved.	Remove tree.
Northern Storm Drainage Outfall/Pedestrian path trees							
69	Coast live oak	<i>Quercus agrifolia</i>	4	4	Protected	Tree has been regularly sheared over its life and has taken on a shrub form. The tree stands near the proposed pedestrian path. At least four feet of clearance should be provided between the trunk and path.	Preserve and Protect.

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health & Structure (1-5)	Protected Status	Comments	Construction Status/Recom'd
70	Coast live oak	<i>Quercus agrifolia</i>	7	4	Protected	Tree has been regularly sheared over its life and has taken on a shrub form. The tree stands near the proposed pedestrian path. At least four feet of clearance should be provided between the trunk and path.	Preserve and Protect.
71	Fruiting pear	<i>Pyrus spp.</i>	3	2	Unprotected	The tree exhibits poor health as indicated by the number of dead branches in the canopy.	Remove tree.
72	Oregon Ash	<i>Fraxinus latifolia</i>	8, 8, 7, 6	4	Protected	The tree is on the stream bank outside the existing wire fence.	Preserve and Protect. Prune to raise the canopy for outfall construction clearance.

TREE REPLACEMENT CALCULATIONS

Tree Replacement Calculations

(1:1 Mitigation Replacement Ratio with select 2:1 Mitigation)

Tree #	Common Name	Botanical Name	Trunk Diameter(s) (Inches)	Health Condition	Calculated Dbh	Mitigation Ratio	Number of Replacement Trees
24	Coast Live Oak	<i>Quercus agrifolia</i>	8.5, 7.5	5	12.3	1 to 1	6.1
25	Coast Live Oak	<i>Quercus agrifolia</i>	12.5	5	12.5	1 to 1	6.3
27	Valley Oak	<i>Quercus lobata</i>	6	5	6.0	1 to 1	3.0
29	Valley Oak	<i>Quercus lobata</i>	10	4	10.0	1 to 1	5.0
33	California Walnut	<i>Juglans hindsii</i>	6	5	6.0	1 to 1	3.0
34	Oregon Ash	<i>Fraxinus latifolia</i>	6	5	6.0	1 to 1	3.0
36	Red Willow	<i>Salix laevigata</i>	9.5	4	9.5	1 to 1	4.8
37	Red Willow	<i>Salix laevigata</i>	8	3	8.0	1 to 1	4.0
38	Red Willow	<i>Salix laevigata</i>	11	4	11.0	1 to 1	5.5
39	California Buckeye	<i>Aesculus californica</i>	6, 6, 5	4	11.5	1 to 1	5.8
*44	Red Willow	<i>Salix laevigata</i>	17.5	2	17.5	2 to 1	4.4
45	Valley Oak	<i>Quercus lobata</i>	7	5	7	1 to 1	3.5
46	Oregon Ash	<i>Fraxinus latifolia</i>	1.5	4	1.5	1 to 1	0.8
*47	Red Willow	<i>Salix laevigata</i>	3	2	3.0	2 to 1	0.8
48	Red Willow	<i>Salix laevigata</i>	3	4	3.0	1 to 1	1.5
*50	Red Willow	<i>Salix laevigata</i>	5, 3.5, 3	2	8.0	2 to 1	2.0
51	Red Willow	<i>Salix laevigata</i>	3.5	3	3.5	1 to 1	1.8
52	California Buckeye	<i>Aesculus californica</i>	1.5	4	1.5	1 to 1	0.8
54	Red Willow	<i>Salix laevigata</i>	3	3	3.0	1 to 1	1.5
55	California Buckeye	<i>Aesculus californica</i>	3.5	4	3.5	1 to 1	1.8
56	California Buckeye	<i>Aesculus californica</i>	3, 2.5, 2.5	4	5.0	1 to 1	2.5
*57	California Buckeye	<i>Aesculus californica</i>	5, 2.5	2	6.0	2 to 1	1.5
59	Toyon	<i>Heteromeles arbutifolia</i>	3, 1.5	4	4.0	1 to 1	2.0
68	California Buckeye	<i>Aesculus californica</i>	4	4	4.0	1 to 1	2.0
* 2:1 Mitigation ratio used for trees with poor health condition		Mitigation Requirements:		DBH (in) total required mitigation163.3		Total Replacement Trees (Required)73	

Proposed Replacement Breakdown by Species

Mitigated Tree Species (specie removed per plan)	Replacement Ratio	Required Replacement Tree Quantities	Replacement Tree Specie
<i>Coast Live Oak</i>	1 to 1	12	<i>24" box Oak or CA Buckeye</i>
<i>Valley Oak</i>	1 to 1	12	<i>24" box Oak or CA Buckeye</i>
<i>Red Willow</i>	1 to 1	19	<i>2" diameter Red Willow stakes and/or 15 gal Western Red Bud</i>
<i>Red Willow</i>	2 to 1 (trees with a health score of 2)	7	<i>2" diameter Red Willow stakes and/or 15 gal Western Red Bud</i>
<i>Oregon Ash Trees</i>	1 to 1	4	<i>24" box Oak or CA Buckeye</i>
<i>California Buckeye</i>	1 to 1	13	<i>24" box Oak or CA Buckeye</i>
<i>California Buckeye</i>	2 to 1 (trees with health score of 2)	1	<i>24" box Oak or CA Buckeye</i>
<i>Northern CA Walnut</i>	1 to 1	3	<i>24" box Oak or CA Buckeye</i>
<i>Toyon</i>	1 to 1	2	<i>Proposed 15 gal Western Redbud Replacement Trees</i>

Proposed Replacement Totals

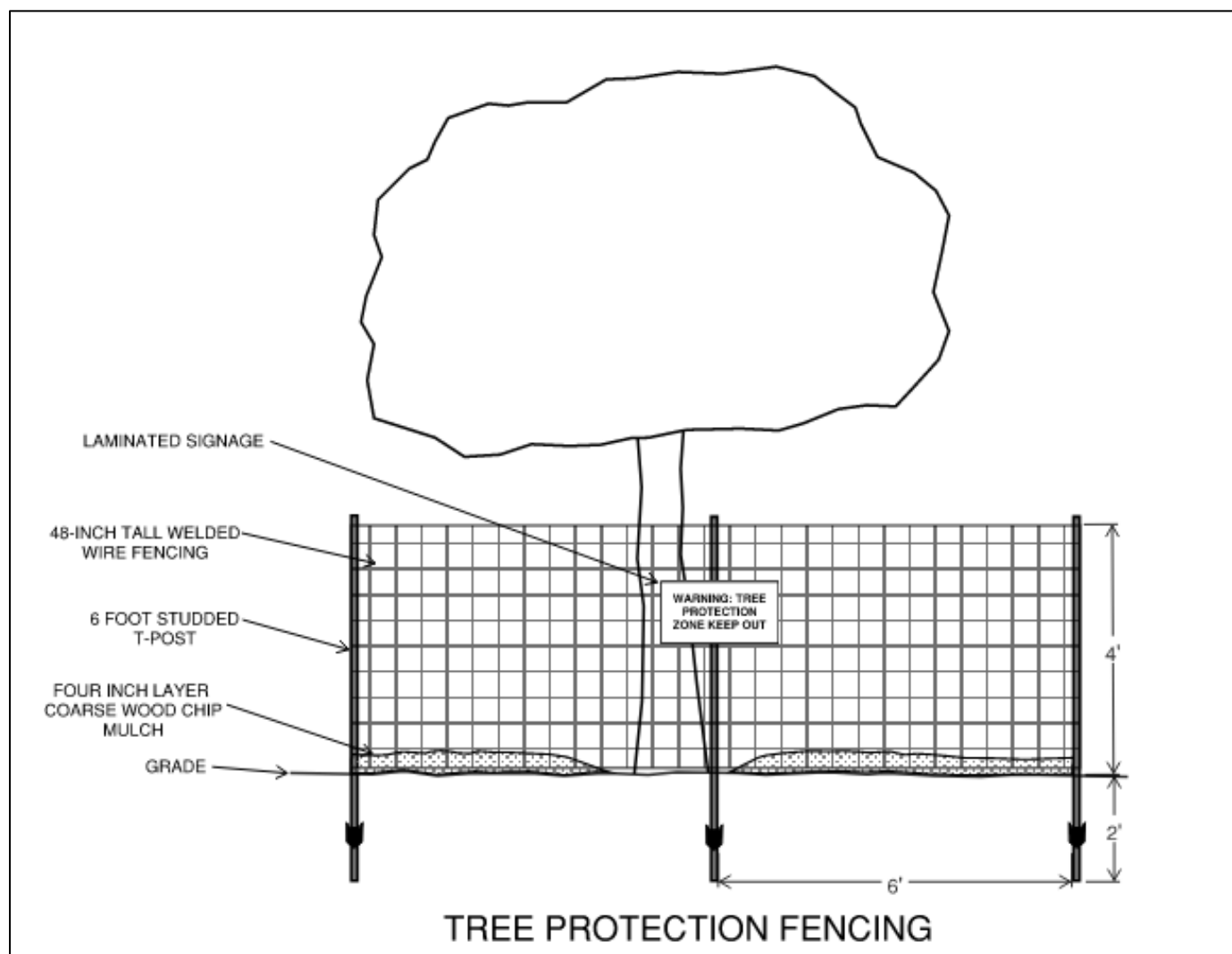
Proposed Replacement Trees Quantity	Proposed Replacement Tree Species/Sizes
45	<i>Proposed 24" box Oak or CA Buckeye Replacement Trees</i>
26	<i>2" diameter Red Willow stakes and/or 15 gal Western Red Bud</i>
2	<i>Proposed 15 gal Western Redbud Replacement Trees</i>
73	Required Replacement Trees
73	Proposed Mitigation Trees
0	<i>Remaining Replacement Trees Needed</i>

In Lieu fee Calcs

24" box tree Qty	Approximate Price per Tree	Total In- Lieu Fees
0.0	\$750	\$0

TREE PROTECTION FENCING

4-foot-tall wire deer fencing shall be used to create the **tree protection zones**, as shown on sheets L-5, L-5.1 & L-5.2. Fencing shall be supported with 6' metal t-stakes and installed 6-foot on center. Laminated signage shall be attached to the fencing and read "Warning Tree Protection Zone Keep Out". Signage shall be kept visible and intact throughout the project. Failure to comply with the tree protection plan may result in a stop work order.



CEQA RESPONSES

As the project arborist, I have reviewed and approved the following tree protection measures that SJLA and I developed to protect trees during the project.

Trees

Expand the tree inventory with mitigation measures within Adobe Creek in conjunction with the proposed pedestrian bridge construction and storm drainage outfall locations. This process includes but is limited to:

1. A site inspection by Urban Forestry to identify and tag all trees (1 inch or greater) together with the canopy diameters within a 25-foot radius of the proposed bridge alignment and storm drainage outfall locations.
2. Survey the positions of all trees.
3. Prepare an updated tree inventory.
4. Identify trees to be saved, removed, or pruned.
5. Identify short-term (bridge construction) and long-term impacts on trees.
6. Provide updated mitigation measures (species, number, locations) with a replacement ratio basis.

Tree Survey and Assessment

The project arborist and surveyor conducted a field visit where trees 1" and above were tagged within 25 radius of the bridge alignment. Surveyors mapped the trees on the plans, and the Arborist has updated their inventory to reflect the expanded area of impact. (See attached Arborist Tree Inventory by Urban Forestry). Existing tree canopies showing the edges of the tree canopy masses have been provided on our plans from recent field surveys on site, but individual tree canopies are not shown as the tree canopies overlap and are mostly irregular in form due to the densely crowded growth of the trees within the riparian area. See L-5 Tree Removal Preservation and Replacement Plan for the graphic exhibit showing existing tree dripline edges.

Tree Removal and Pruning

The Project Arborist will be onsite during the bridge's construction to oversee potential impacts to the creek vegetation and direct construction away from sensitive/protected areas as much as possible. During the most recent field survey of the existing trees, the Project Arborist deemed specific trees to be removed due to the construction of the proposed bridge. These trees are within the footprint of the bridge or within 10' of the bridge itself where the impacts of the bridge construction would be too devastating. Trees outside of the 10' impact area are to be monitored during construction for Arborist guided selective, minimal pruning, as needed to allow for construction clearance if necessary. With the removal of the trees within the footprint of the bridge and within the 10' offset clear area. Tree canopies that would otherwise be conflicting with the bridge construction will also be reduced as a result of the tree removals. Ultimately, tree removal and pruning will be under the supervision of the project arborist during construction.

Tree Protection Mitigation for Short-Term Impacts

Bridge construction will be done during the dry season, and incorporating some temporary irrigation will be strongly considered for the trees within 25' of the bridge alignment since there will be some new sun exposure to areas of the riparian corridor floor that have been otherwise shaded. Irrigation would remain through the dry season and the Project Arborist and biologist would monitor the trees to determine when the irrigation could be removed. Detailed within the arborist report, tree protection fencing will be required at the edge of the driplines or tree protection zones, significantly reducing potential impacts from construction. Other means of protecting trees from construction would include trunk protection of existing trees to reduce potential impacts from construction equipment. The project arborist will work together with the biologist to provide the least impactful tree protection measures within the riparian zone. This could be in the form of 2x4 lumber strapped to the trunks or the installation of yellow rope. Plywood laid out over the riparian floor would be considered where tree

protection zones/critical root zones exist and where equipment may be used, to help disperse weight of equipment and reduce soil erosion and root compaction. Areas where soil is exposed may also receive 3" deep of arbor mulch to help retain moisture and to mitigate against soil compaction within the tree

protection zone. The contractor will have to use the least impactful method of excavation if in close proximity to existing tree roots. If construction creates a lot of dust on existing vegetation, it will be recommended that the contractor wash down vegetation that has thick layers of dust.

Tree Mitigation and Replacement

Mitigation for the trees removed within the area will conform to the City of Petaluma Tree Preservation Ordinance (Chapter 17 IZO). The mitigation ratio for healthy trees will be at a 1:1 ratio and trees with poor health scores of 2 or less will be replaced at 2:1. The intent of the Mitigation will be to replace the removed trees with an in-kind native species. Willows to be removed will either be replaced with another willow or Western Redbud. Replacement of the red willows will prioritize Mitigation within the riparian corridor, adjacent to the site if there is adequate room. Willows grow within the creek and the intent will be to provide 1-2" willow stakes where possible within the riparian corridor, using branches from existing willows. If space runs out, the remaining will be Mitigation of the willows using the Western Redbuds on the upland portion of the site, adjacent to the creek. All other trees to be mitigated will be replaced, using native oaks and California Buckeye within the upland areas adjacent to the creek.

Inspection of Protection and Preservation Measures (High-Level Action Plan)

Prior to the mobilization of construction, the Arborist will meet with the contractor to review tree protection/preservation measures, designate tree removals, delineate the location of tree protection/non-intrusion zone fencing, specify equipment access routes and materials storage areas, and review the existing condition of trees to provide any additional necessary recommendations. After installation of the NIZ fencing, the Arborist will inspect for adequate installation of tree protection measures review any contractor request for access, soil disturbance or excavation areas within root zones of protected trees. Assess any changes in the health of trees since the last inspection.

During excavation/construction activities near the trees, an arborist will inspect activity within the non-intrusion zones of the preserved trees and any recommendations implemented. Assess any changes in the health of trees since the last inspection.

At the final inspection, the Arborist will inspect tree health and make any necessary recommendations.

APPENDIX F

AQUATIC RESOURCES DELINEATION REPORT

DRAFT Aquatic Resource Delineation
Creekwood Housing Development Project, Petaluma,
Sonoma County, California



Prepared For: Falcon Point Associates, LLC
3496 Buskirk Ave, Suite 104
Pleasant Hill, CA 94523
Contact: Doyle Heaton

In Contract to: Montrose Environmental
1801 7th Street, Suite 100
Sacramento, CA 95811
Contact: Jennifer Scholl

Report Date: May 17, 2024



Sacramento Valley 🍃 Inland Empire 🍃 Greater Los Angeles 🍃 San Diego
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Project Team

Report Author(s): Steven Johnson and Gregory Garcia

Field Surveyor(s): Jinnah Benn and Steven Johnson

GIS: Dustin Baumbach

Project Manager: James Stewart

Principal in Charge: Jinnah Benn

Review Committee: Jinnah Benn and James Stewart

Recommended Citation: Bargas Environmental Consulting. 2024. Aquatic Resources Delineation – Montrose Environmental, Petaluma, Sonoma County, California. Report prepared for Montrose Environmental.



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Appendices

- A. Montrose February 2024 Aquatic Resources Delineation Report
- B. Arid West Wetland Data Forms
- C. Representative Site Photographs
- D. Custom Soil Resource Report
- E. Observed Plant Species
- F. GIS Shapefiles and ORM Upload Spreadsheet (electronic only attachment)



This Aquatic Resource Delineation updates and incorporates the Aquatic Resources Delineation Report dated February 2024 by Montrose Environmental (**Appendix A**). Recent changes in hydrologic conditions have occurred within the project site since the development of the adjacent parcel. This delineation report includes the results of an additional survey conducted by Bargas Consulting in March 2024 to capture the recent changes conditions.

Introduction

This report presents the results of an Aquatic Resources Delineation (ARD) conducted by Bargas Environmental Consulting (Bargas) for the Creekwood Housing Development Project (Proposed Project) located south of Casa Grande Road in Petaluma, Sonoma County, California (**Figure 1**. Site and Vicinity). The purpose of the delineation was to identify potential aquatic resources occurring within the Study Area and to provide the U.S. Army Corps of Engineers (USACE) with sufficient information to determine if these aquatic resources are jurisdictional wetlands or other waters of the United States (U.S.), as defined by the USACE under Section 404 of the Clean Water Act (CWA).

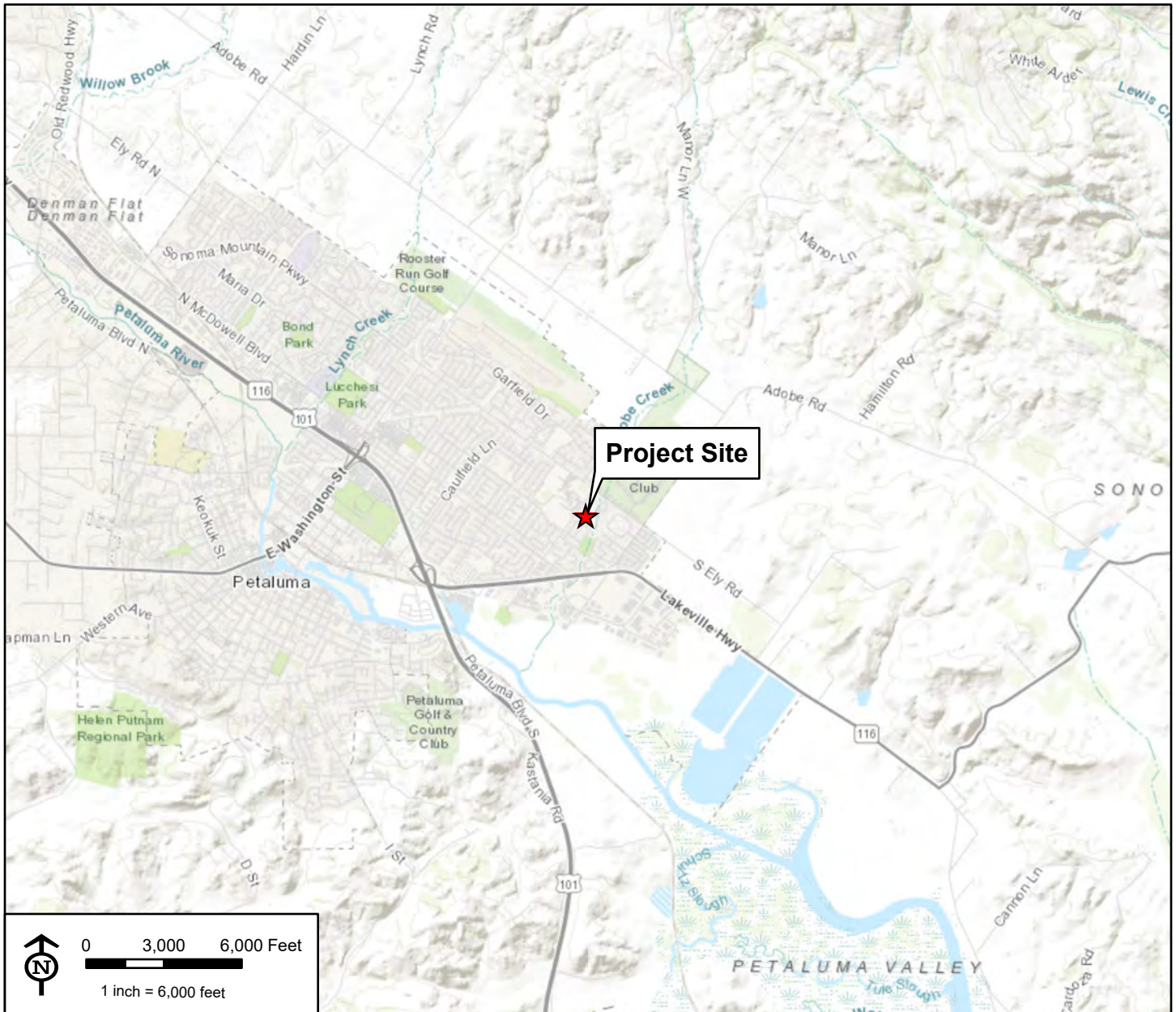
1.1 Study Area Location and Description

The Applicant proposes to add an access road west from Casa Grande Road. The Study Area for this report includes two parcels totaling 5.2 acres at 270 and 280 Casa Grande Road. The Study Area is shown in **Figure 2**.

The Study Area may be accessed at Casa Grande Road, Petaluma, California. From the City of Sacramento, take I-80 west towards San Francisco. Proceed on CA-99S for 50 miles to CA-37 N towards Novato/San Rafael; proceed on CA-37 N for 15.5 miles and turn right onto Lakeville Highway for 8.6 miles. Turn right onto Browns Lane for 0.3 miles, left on South Ely Road for 1.7 miles, and left onto Casa Grande Road for 0.2 miles.

1.2 Project Applicant and Agent

Applicant	Co-Agents
Falcon Point Associates, LLC 3496 Buskirk Ave, Suite 104 Pleasant Hill, CA 94523	Bargas Environmental Consulting, LLC ATTN: Angela DePaoli 3604 Fair Oaks Boulevard, Suite 180 Sacramento, CA 95864 Montrose Environmental ATTN: Jenn Scholl/Cedrick Villaseñor 1801 7 th Street, Suite 100 Sacramento, CA 95811



Source: ESRI ArcGIS Online Basemap - World Topographic Map, World Street Map



Public Land Survey System (PLSS):
Mount Diablo Meridian, Township 5N, Range 7W, Sections 26 & 35

USGS Quad(s): Petaluma River (2021)

Watershed: San Pablo Bay (18050002)

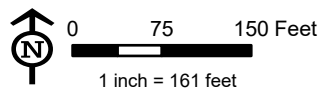
Project Site Coordinates: - 10S 535300 4232677

Figure 1
Project Site and Vicinity

Creekwood Residential Project



Source: Bing Maps Hybrid



Study Area

Figure 2
Study Area

Creekwood Residential Project



2 Regulatory Setting

The regulatory setting with regards to aquatic resources is framed by current enabling legislation and case law. Under Section 404 of the CWA, the USACE regulates the discharge of dredged and fill materials into “waters of the U.S.” Jurisdictional waters of the U.S. include “territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; tributaries; lakes and ponds, and impoundments of jurisdictional waters; and adjacent wetlands” (33 CFR § 328.3). Certain waters of the U.S. are considered “special aquatic sites” because they are generally recognized as having ecological value; such sites include sanctuaries and refuges, wetlands, mudflats, vegetated shallows, and riffle and pool complexes (40 CFR § 230). Special aquatic sites are defined by the U.S. Environmental Protection Agency (USEPA) and may be afforded additional consideration in a project’s permit process. The USACE also regulates navigable waters under Section 10 of the Rivers and Harbors Act of 1899. Navigable waters are defined as “... those waters of the U.S. that... are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce” (33 CFR § 322.2). Projects that place fill in jurisdictional wetlands and non-wetland waters of the U.S. require a permit from the USACE under Section 404 of the CWA. The USACE issues nationwide permits for specific types of activities with minimal individual or cumulative adverse environmental impacts. Individual permits are required for large and/or complex projects or projects that exceed the impact threshold for nationwide permits. Recent federal rulemaking has modified how the USACE defines certain waters of the U.S. The most pertinent rules are summarized below.

The regulatory setting is framed by current enabling legislation and case law. As of August 29, 2023, the USEPA and USACE amended the definition for “waters of the United States” per the Supreme Court ***Sackett v. U.S.*** decision. The previous overarching regulatory decision – the 2023 Rule – has had three distinct components modified.

1. Under the ***Sackett v. USEPA*** decision, waters are no longer jurisdictional under the CWA due to the “*significant nexus standard*.”
2. Under the ***Sackett v. USEPA*** decision, wetlands are not defined as “adjacent” or jurisdictional under the CWA solely because they are “bordering, contiguous, or neighboring or separated” from other “waters of the United States” by man-made dikes or barriers, natural river berms, beach dunes.
3. Under the ***Sackett v. USEPA*** decision, the USEPA and USACE are removing “interstate wetlands” from the 2023 Rule. The Court ruled that the use of the term “waters” referred to “open waters” and not wetlands so determined that a wetland is not jurisdictional due to singularly being interstate.

The remainder of the 2023 Rule will continue to regulate the interpretation of defining “waters of the United States.” Because these changes are so recent, further coordination is needed with USACE regulatory staff to better refine the appropriate jurisdictional determination for mapped aquatic features on a project site.

In a previous determination the USEPA published a revised definition of “waters of the United States” on December 7, 2021, in response to President Biden’s Executive Order 13990 (86 Federal Register 7037) and after *Pascua Yaqui Tribe v. EPA* in which the U.S. District Court of the District of Arizona “vacated and remanded” the Navigable Waters Protection Rule (86 Federal Register 69372). The proposed revision was published in the



Federal Register on January 18, 2023, and took effect on March 20, 2023. Due to litigation, the agencies interpreted “waters of the United States” consistent with pre-2015 regulations and the Supreme Court cases of *Rapanos v. United States* and *Carabell v. United States* (USEPA 2008), meaning the USACE asserted jurisdiction over traditional navigable waters (TNW) and the following types of features determined to have “significant nexus” to a TNW:

1. wetlands adjacent to TNWs.
2. non-navigable tributaries of TNWs that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally.
3. wetlands that directly abut non-navigable tributaries of TNWs.

However, the Sackett decision to remove the *significant nexus standard* and *adjacency* criteria with regards to what constitutes a jurisdictional wetland substantially redefines the pre-2015 regulations.

The most pertinent rules are summarized below.

Wetlands are defined under 33 C.F.R. 328.3(c)(16) as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The limits of USACE jurisdiction in non-tidal waters extend to the Ordinary High-Water Mark (OHWM), which is defined under 33 CFR 328.3(c)(7) as:

That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Non-wetland features include:

Upland and lowland areas that are neither deep water aquatic habitats, wetlands, nor other special aquatic sites. They are seldom or never inundated or, if frequently inundated, they have saturated soils for only a brief period of time during the growing season. If these features are vegetated, they normally support species that are predominantly adapted to aerobic soil conditions (USACE - Environmental Laboratory 1987).

The EPA and the Department of the Army published the “Navigable Waters Protection Rule” in the *Federal Register* on April 21, 2020, which officially went into effect on June 22, 2020 (Federal Register 2020). This rule redefined the “Waters of the United States” into four categories:

1. the territorial seas and TNW,
2. perennial and intermittent tributaries to those waters,
3. certain lakes, ponds, and impoundments, and
4. wetlands adjacent to jurisdictional waters.



Aquatic Resource Delineation

Creekwood Housing Development Project, Petaluma, Sonoma

County

2007-24

May 17, 2024

The Navigable Waters Protection Rule was vacated on August 30, 2021, with a decision by the U.S. District Court for the District of Arizona. This decision does not affect the determinations made in this report.



3 Methodology

This report has been prepared per the Regulatory Division of the Sacramento District, USACE minimum standards (USACE 2016a). In addition, the following manuals and guidance were used to delineate waters of the U.S. and wetlands that are potentially subject to USACE jurisdiction under Section 404 of the CWA:

- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual* (Lichvar and McColley 2008);
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979)

Before conducting the field delineation, the following information sources were reviewed:

- Aerial imagery of the Study Area and the vicinity (Google Earth 2022)
- Natural Resources Conservation Service (NRCS) soil survey maps and unit descriptions, Web Soil Survey, Sonoma County (NRCS 2024)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) - Wetlands Online Mapper (USFWS 2024)

3.1 Delineation Survey and Field Conditions

Bargas biologists Jinnah Benn and Steven Johnson conducted the aquatic resources delineation on Tuesday, March 5, 2024. Weather conditions were typical for the season with temperatures ranging from 50 to 55 degrees Fahrenheit, low wind speeds, and light precipitation. The site assessment consisted of walking meandering transects throughout the Study Area to identify aquatic features that could fall under the jurisdiction of the USACE. Mapped soil types in the Project Site were determined using the NRCS Web Soil Survey, Custom Soil Resource Report (NRCS 2024). Plant nomenclature followed *Jepson eFlora* (Jepson 2021). The *USACE National Wetland Plant List, version 3.4* (USACE 2018), was used to determine the status of observed plants as wetland indicator species. Three parameter data sheets are included in **Appendix B**. Site photographs are presented in **Appendix C**.

3.2 Mapping

Wetland boundaries within the Study Area were surveyed and mapped using an Eos Positioning Systems Arrow GNSS Global Positioning System (GPS) technology receiver paired with Esri Field Maps applications. This GPS is capable of real-time differential correction and sub-meter accuracy. The GPS data were downloaded through ArcGIS Online and converted into Esri shapefile format. The geographic coordinate system used to reference the data was North American Datum (NAD83) State Plane California III in feet.

Wetlands were mapped by walking along the outer edges of wetted areas. Data was overlaid on an aerial photograph provided by Esri ArcGIS World Imagery. The Esri data and GIS software were used to calculate the acreage of the polygon. Mapping requirements, as set forth by *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016b) and the *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2016a) were followed.

4 Environmental Setting

Most of the Study Area is located on a maintained homestead extensively grazed by domestic sheep (*Ovis aries*). A perennial creek (Adobe Creek) and associated riparian wetland vegetation communities are located along the



southeast boundary of the Study Area. The Study Area is surrounded by residential housing. Casa Grande Road and a school are located northwest of the Study Area (Google Earth 2024).

4.1 Soils

Mapped soil types in the Study Area were determined using the Soil Survey Geographic Database (SSURGO) and NRCS Web Soil Survey, Custom Soil Resource Report (NRCS 2024). One soil type occurs within the Survey Area (**Figure 3**). **Table 1** identifies the soil type by series and subgroup, map symbol, and hydric characteristics. The NRCS soil report for the Study Area is included in **Appendix D**.

Table 1. Soil Types within the Study Area

Soil Series	Map Symbol	Hydric Rating
Clear Lake Clay, Sandy Substratum, 0-2 percent slopes.	CeA	Yes

Source: NRCS 2024

The Clear Lake clay is composed of clay down 0-52 inches in depth, clay loam 52-60 inches, fine sandy loam 60-72 inches, and stratified loamy coarse sand to clay loam 72-84 inches. Soils are poorly drained with a depth to the restrictive feature more than 80 inches deep and a depth of 0 inches to the water table.

4.2 Vegetation Communities

The majority of the Study Area consists of grazed pasture. The pasture consisted of annual grassland including Mediterranean grasses and forbs. Three seasonal wetlands in the southern portion of the Study Area contained typical wetland hydrophytic vegetation. Adobe Creek is with an associated riparian corridor is located behind the residential home along the southeast boundary of the Study Area. Two residential dwellings, roads and infrastructure were mapped as developed/disturbed.

Developed/Disturbed

A total of approximately 1.29 acres of the Project Site are classified as developed/disturbed, as shown in Figure 4. Two residences are located within the Project Site. A gravel driveway off Casa Grande Road provides access to the existing residence on the east side of the Project Site along with multiple outbuildings. An additional residence is located at the entrance to the Project Site along Casa Grande Road. A large portion of the area surrounding the outbuildings and houses is characterized by bare ground with compressed gravel for vehicle driving and parking. Areas that are not graveled are planted with ornamental and plant 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 of Appendix C.

Annual Grassland

Approximately 4.24 acres of annual grassland habitat occurs within the Project Site. The annual grasslands fall under the classification of *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (CNPS 2024). This area, shown in Figure 4, had been disked and planted with mixed non-native grasses and forbs as forage crops for sheep grazing. Species observed in these fields include oats (*Avena* sp.), soft brome (*Bromus hordeaceus*), riggut brome (*Bromus diandrus*), wall barley (*Hordeum murinum*), bristly ox-tongue (*Helminthotheca echioides*) common stork's-bill (*Erodium botrys*), and Italian ryegrass (*Festuca perennis*). Representative photos of this habitat can be seen in Photos 2, 5, 8, and 9 of Appendix C.



Riparian

A total of 1.12 acres of riparian habitat occurs along Adobe Creek located along the eastern boundary of the Project Site, as shown in Figure 4 of Appendix A. The riparian habitat is classified as *Salix lasiolepis* Shrubland Alliance (CNPS 2023b). This riparian corridor includes species such as Himalayan blackberry (*Rubus armeniacus*), coast live oak (*Quercus argifolia*), valley oak (*Quercus lobata*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), California buckeye (*Aesculus californica*), big leaf maple (*Acer macrophyllum*), fennel (*Foeniculum vulgare*), and flat top sedge (*Cyperus eragrostis*) occur within this riparian corridor. English ivy (*Hedera helix*) is growing throughout the riparian habitat in the vicinity of the residential home.

Seasonal Wetland

Within the annual grassland habitat, three separate seasonal wetlands totaling 0.09 acres occur in the annual grassland on the southern portion of the Project Site as shown in Figure 4 of Appendix A. These wetlands include species such as clustered dock (*Rumex conglomeratus*), water pygmyweed (*Crassula aquatica*), hyssop loosestrife (*Lythrum hyssopifolia*), and Italian ryegrass.

Riverine (Adobe Creek)

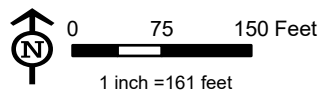
Adobe Creek drains the Sonoma Mountain Watershed and flows south where it confluences with the Petaluma River, then the San Pablo Bay, then San Francisco Bay and finally the Pacific Ocean. Adobe Creek is a second order stream and mapped as a blue line stream according to the USGS National Hydrography Dataset (NHD; USGS 2024). The USFWS National Wetlands Inventory map identified Adobe Creek as riverine habitat (USFWS 2024). Adobe Creek is a second order stream and mapped as a blue line stream according to the USGS National Hydrography Dataset (NHD; USGS 2024). The USFWS National Wetlands Inventory map identified Adobe Creek as riverine habitat (USFWS, 2023c; Appendix C). The creek displays a clear ordinary high-water mark (OHWM), top of bank, and therefore is likely be considered a Water of the U.S. and State of California subject to USACE and RWQCB jurisdiction, respectively. Adobe Creek (as shown in Figure 4 and Photo 4 of Appendix C).

Approximately 623 linear feet (0.22 acres) of the creek flow within the Project Site. The width of the creek averages 15 feet. The substrates vary from cobble to sand bars. The majority of the riverine habitat is covered by tree canopy with more openings in the canopy in the southern section. Adobe Creek was assessed by the CDFW and determined to provide suitable habitat for anadromous fishes (CDFW, 2008). A representative photo of Adobe Creek is included in Photo 4 of Appendix C.

The National Wetland Plant List (NWPL) was used to categorize plants identified within the Study Area according to the following Wetland Status Indicators categories: OBL (Obligate), FACU (Facultative Upland), FACW (Facultative Wetland), FAC (Facultative), or NL (Not Listed) on the NWPL. Some plants were not able to be identified to species and were labeled as N/A since no indicator was able to be identified on the NWPL. A list of plant species observed within the Study Area and their respective NWPL indicator status are presented in **Appendix E**.



Source: Bing Maps Hybrid, NCRS Soils Data (10/2021)



- Study Area
- CeA - Clear Lake Clay, Sandy Substratum, 0 - 2 Percent Slopes

Figure 3
Soils Map

Creekwood Residential Project



4.3 Hydrology

The Study Area is situated within Petaluma, California (Hydrologic Unit Code -18050002). A review of Google Earth aerial imagery and the National Wetland Inventory showed a large area in the southern pasture of the Study Area with indicators of inundation and a riparian corridor associated with Adobe Creek along the southeastern boundary (NWI 2024, Google Earth 2023). Field observations confirmed that there are three depressional wetlands located in the southern pasture and freshwater woodland habitat associated with Adobe Creek.

The depressional wetlands likely become inundated with water throughout the year due to heavy precipitation events during the growing seasons. Adobe Creek is a perennial riverine system that flows from the northeast corner of the Study Area southwest approximately 1.30 miles, where it converges with Petaluma River. The Petaluma River flows southeast for approximately ten miles before emptying into San Pablo Bay. As the system travels east to San Pablo Bay it passes through several tidal wetlands.



5 Delineation Results

Three seasonal wetlands (SW-01, SW-02, SW-03) were observed within the annual grassland habitat in the southern portion of the Study Area. In addition, a perennial stream was observed flowing along the southeastern boundary of the Study Area (**Figure 4a**). Representative photograph locations are shown on **Figure 4b** and photographs are included in Appendix C.

5.1 Features Observed in the Study Area

Three seasonal wetlands, and one perennial stream were found with standing or flowing water within the Study Area (**Table 2** and Figure 4a). Hydrophytic vegetation and wet soils are present within the Study Area.

Table 2. Features Observed in the Study Area

Feature Type	Label	Area (acres)*	Length (linear feet)
Seasonal Wetland 1	SW-01	0.023	N/A
Seasonal Wetland 2	SW-02	0.066	N/A
Seasonal Wetland 3	SW-03	0.004	N/A
Perennial Creek (Adobe Creek)	Adobe Creek	0.22	623

Source: Bargas, 2024. *Acreages are calculated estimations that are subject to modification pending formal verification by USACE.

5.1.1 Seasonal Wetlands

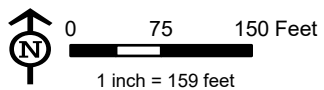
Seasonal wetlands compose a combined total of approximately 0.09 acre within the Study Area. Each wetland was observed to have standing water at the time of the survey. These features appeared natural, however an artificially built embankment runs the southwestern portion of the Study Area, which could contribute to additional pooling, especially as a housing development has been constructed adjacent to the property within the past three years. A rain event that had occurred before and during the survey also contributed to the size of the seasonal wetland. Typical hydrophytic vegetation was observed in all three seasonal wetlands including white water crowfoot (*Ranunculus aquatilis*), hyssop loosestrife, aquatic pygmy weed, western manna grass (*Glyceria occidentalis*), and fiddle dock (*Rumex pulcher*).

5.1.2 Perennial Creek

Adobe Creek (0.22 acres) and adjacent riparian habitat (1.12 acres) are located in the southeastern portion of the Study Area. Vegetation within the riparian habitat is primarily dominated by Himalayan blackberry, English ivy, buckeye, and valley oak. One blue elderberry shrub (*Sambucus mexicana*) was found within the riparian habitat. Elderberry shrubs represent potential habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), a special status species however, the Study Area is outside the known range for this species.



Source: Bing Maps Hybrid



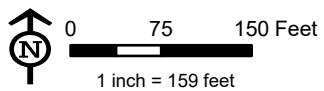
- Study Area
- Seasonal Wetland (0.09-acre)
- Adobe Creek
- Upland Point
- Wetland Point

Figure 4a
Aquatic Resource Delineation

Creekwood Residential Project



Source: Bing Maps Hybrid



- Study Area
- Photo Points
- Seasonal Wetland (0.09-acre)
- Adobe Creek

Figure 4b
Photo Points

Creekwood Residential Project



6 Conclusion

The Study Area is primarily composed of grazed pasture. Two residential homes and associated landscaping are in the northern and southern portions of the site. Hydrophytic vegetation, wetland soils, and hydrology observed within the Study Area are characteristic of wetland features and riparian habitat for the local region.

Aquatic resources include three seasonal wetlands and a perennial creek with surrounding riparian vegetation. The three seasonal wetlands are located relatively close together in the southern portion of the Study Area adjacent to a recently constructed residential development. These wetlands have no outlet and continue to pool during the rainy season until they evaporate dry during warmer weather. Adobe creek runs north to south along the eastern portion of the Study Area, eventually meeting up with the Petaluma River and ultimately San Pablo Bay. Topography within the Study Area suggests that water remains in place until evaporation dries out the area. The USACE must determine if these aquatic features are jurisdictional and subject to permitting requirements under Section 404 of the Clean Water Act.



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Appendix A. Aquatic Resource Delineation Report, Montrose 2024



AQUATIC RESOURCES DELINEATION REPORT

FALCON POINT ASSOCIATES, LLC

CREEKWOOD HOUSING DEVELOPMENT PROJECT

FEBRUARY 2024

PREPARED FOR:

Falcon Point Associates, LLC
3496 Buskirk Ave, Suite 104
Pleasant Hill, CA 94523

PREPARED BY:

Montrose Environmental
1801 7th Street, Suite 100
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(916) 447-3479
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AQUATIC RESOURCES DELINEATION REPORT

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EXECUTIVE SUMMARY

CREEKWOOD HOUSING DEVELOPMENT PROJECT AQUATIC RESOURCES DELINEATION REPORT

Montrose Environmental (Montrose) conducted an aquatic resources delineation of the approximately 6.87-acre Creekwood Housing Development Project (Project Site/Study Area) and identified the Ordinary High Water Mark (OHWM) of Adobe Creek totaling approximately 620 linear feet (0.22 acres) within the Study Area. This riverine feature appears unaltered with a meandering flow line and was observed with flowing water during some of the field surveys to support this delineation.

This aquatic resources delineation report has been prepared in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE, 2016), *Field Guide to Wetland Delineation* (Wetland Training Institute, Inc., 1995), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE, 2008), the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (USACE and EPA, 2007), and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). In addition, this delineation has been conducted in accordance with the 2008 “A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States”. Refer to the balance of this report for specific information regarding aquatic resource findings on the Study Area including: number and total area of aquatic resources; total acreage of the survey area; dominant aquatic resource classifications and general condition of aquatic resources.

A signed statement from the property owner allowing USACE personnel to enter the property and to collect samples during normal business hours is included as **Appendix G**.

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ACRONYMS

APN	Assessor's Parcel Number
ARDR	Aquatic Resources Delineation Report
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
PEM	Palustrine Emergent
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

SECTION 1.0

INTRODUCTION

On behalf of the Falcon Point Associates, LLC (Developer), Montrose, formerly known as Analytical Environmental Services, conducted an aquatic resources delineation on two parcels, Assessor's Parcel Numbers (APN) 017-040-016 and 017-040-051, comprising 5.2-acres and an added 1.67-acres owned by the City of Petaluma, totaling approximately 6.87-acres (Study Area) for the proposed Creekwood Housing Development Project. The Study Area is located at 270 and 280 Casa Grande Road in the City of Petaluma, Sonoma County, California. This aquatic resource delineation report (Report or ARDR) describes wetlands identified within the Study Area that may be subject to regulation by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA). Information presented in this report provides data required by the USACE *Guidelines for Submission of Wetland Delineations and Determinations* (USACE, 2019). In addition, this delineation has been conducted in accordance with the 2008 "A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States". The wetlands discussed in this report represent a calculated estimate of features within the Study Area, and are subject to modification following the USACE verification process.

The purpose of this report is to identify and describe aquatic resources and, to identify known possible sensitive plant, fish, wildlife species, and cultural/historic properties in the survey area. This report facilitates efforts to:

1. Avoid or minimize impacts to aquatic resources during the design process.
2. Document aquatic resource boundary determinations for review by regulatory authorities.
3. Provide early indications of known sensitive species and historic/cultural properties within the survey area.
4. Provide background information.

The following sections of this report addresses these efforts and was written in conformance with the USACE, Sacramento District, "Minimum Standards for Acceptance of Aquatic Resources Delineations Reports, January 2016.

1.1 APPLICANT, AGENT, AND PROPERTY OWNER INFORMATION

Applicant/Property Owner

Falcon Point Associates, LLC
Attn: Doyle Heaton
3496 Buskirk Ave, Suite 104
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Agent

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SECTION 2.0

LOCATION

The Study Area consists of approximately 6.87-acres of land owned by the Developer, located within the City of Petaluma (Figure 1 of **Appendix A**). The Study Area is situated in an Unsectioned Area of the Petaluma River of Township 4 North, Range 7 West of the Mount Diablo meridian, within the Petaluma River, CA ,U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (quad), and coincides with Sonoma County Assessor Parcel Number 017-040-051 and 017-040-016 (Figure 2 of **Appendix A**). The centroid of the Study Area is at approximately 38° 14' 29.38" N, 122° 35' 46.88" W.

Land uses on the Study Area include grazing, livestock (sheep), and rural residential. Surrounding land uses consist of a senior living center to the north of the parcel, a school to the west of the Study Area, a metalwork and equipment repair shop to the south, and Adobe Creek to the east of the Study Area (Figure 3 of **Appendix A**). Primary land uses within the region include residential and commercial development. Topography within the Study Area consists of flat terrain, elevations range from approximately 46-feet above mean sea level (amsl) to 51-feet amsl. A topographic map and an aerial photograph of the Study Area are shown in Figures 2 and 3, respectively, of **Appendix A**.

2.1 DRIVING DIRECTIONS

To access the Study Area from Sacramento, take I-80 Business West towards San Francisco for approximately 52 miles. Take exit 33B to CA-37W for 15.5 miles then turn right onto Lakeville Highway and continue for 10.2 miles to Petaluma. In Petaluma, take a right turn onto s McDowell Blvd and continue for 0.2 miles to then turn right onto Casa Grande Road. Travel for 0.4 miles and the Study Area will be to the east.

SECTION 3.0

METHODOLOGY

This report has been prepared in accordance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE, 2016), the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987), Field Guide to Wetland Delineation (Wetland Training Institute, Inc., 1995), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE, 2008), the U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook (USACE and EPA, 2007), A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley, 2008), and the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979).

3.1 SURVEY METHODOLOGY

Site surveys were conducted by MES biologists on three dates listed below in **Table 1**.

TABLE 1 SITE SURVEY DATES AND INVESTIGATORS

Year	Date	Investigators
2020	April 15	Cedrick Villaseñor, David Pfuhler
2020	June 15	David Pfuhler
2021	November 24	David Pfuhler
2023	May 17, 2023	Cedrick Villaseñor

Prior to the surveys, a background records search was conducted using the following sources:

- Google Earth satellite imagery (Google Earth 2023);
- Historical aerial photography of the Project Site and surrounding area (EDR, 2021);
- High resolution LiDAR derived hillshade of the Study Area and vicinity (Sonoma County 2023);
- Soil survey maps and unit descriptions from the Natural Resources Conservation Service (NRCS) (NRCS, 2020a) (Figure 4 of **Appendix A**);
- Hydric soil information (NRCS, 2020b);
- U.S. Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI; USFWS, 2023a; Figure 5 of **Appendix A**);
- California Aquatic Resources Inventory (CARI; SFEI 2023)

During the site surveys, Montrose biologists walked meandering transects throughout the Study Area to determine locations of potential wetlands and waters of the U.S. Adobe Creek was examined to document the lateral extent of diagnostic characteristics of the stream, which included identification of the OHWM, bed and bank, and evidence of ongoing water-driven erosion and deposition were evident at locations. If characteristics of a wetland were observed and one or more of the three wetland parameter criteria were present, data points were sampled. Global positioning systems handheld units (Trimble GeoXH™ and hand-held GPS receiver) with sub-meter accuracy were used in the field to collect sample points and demarcate aquatic features.

3.2 DETERMINATION METHODOLOGY

3.2.1 WETLANDS AND OTHER WATERS

Locations of potential wetlands within the Study Area were determined based on the following three parameter criteria, as described in the Arid West Regional Guide (USACE, 2008):

- The majority of dominant plant species are wetland associated species;
- Hydric soils are present; and
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

These three criteria are used as evidence that an area experiences saturated conditions during the growing season for a minimum of two weeks in an average year. Other evidence may be used to support this conclusion in the professional judgement of the delineators. Factors used for the three parameter approach are described in detail below.

For identification of water bodies other than wetlands subject to federal jurisdiction, two principle field characteristics were evaluated: 1) the presence of a bed and bank; and 2) the presence of an OHWM. The OHWM is defined, in 33 Code of Federal Regulations (CFR) Part 329.11, as the line on the shore established by the fluctuations of water, and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Other characteristics that were noted, where possible, included a description of the hydrologic feature type and length. USACE regulations (33 CFR Part 328) were consulted determine whether these water bodies constitute waters of the U.S.

3.2.2 VEGETATION

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987). Prevalent vegetation is characterized by the dominant plant species comprising the plant community (Wetland Training Institute, Inc., 1995). The dominance test is the basic hydrophytic vegetation indicator and was utilized at each sample point location. The '50/20 rule' was used to select the dominant plant species from each stratum of the vegetation community. The rule states that for each stratum in the community, dominant plant species are the most abundant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional plant species that individually comprise 20 percent or more of the total in the stratum (USACE, 2008).

Dominant plant species observed at each sample point were classified according to their indicator status (i.e., probability of occurring in a wetland) (**Table 2**), according to the *2020 National Wetland Plant List* (USACE, 2020). If the majority (greater than 50 percent) of the dominant vegetation on-site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the site was considered to be dominated by hydrophytic vegetation. Pursuant to the Arid West Supplement (USACE, 2008), plus (+) and minus (-) modifiers were not used (i.e., FAC- and FAC+ plant species are all considered FAC) and plant species not listed in the NWI Plant List were assumed to be upland (UPL) species (USACE, 2008).

TABLE 2 CLASSIFICATION OF WETLAND-ASSOCIATED PLANT SPECIES

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	1%
No indicator status	NI	Information insufficient to determine indicator status
SOURCE: USACOE, 2020		

In instances where indicators of hydric soil and wetland hydrology were present, but the plant community failed the dominance test, the vegetation was re-evaluated using the prevalence index. The prevalence index is a weighted-average wetland indicator status of all plant species in the sample area, where each indicator status is assigned a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighted by percent cover. If the plant community failed the prevalence index, the morphological adaptations of the plants were evaluated.

3.2.3 SOILS

Hydric soils are defined as soils formed under conditions of saturation, flooding, or ponding during the growing season long enough to develop anaerobic conditions in the upper part (NRCS, 2018). Frequently observed indicators of hydric soils include (but are not limited to) histosols, histic epipedon, hydrogen sulfide, stratified layers, depleted below dark surface, depleted matrix, redox dark surface, depleted dark surface, redox depressions, vernal pools, etc. Soil pits are excavated to the depth necessary to observe and document hydric soils indicators, to confirm the absence of indicators, or until refusal. The soils at each sample point was examined for the presence/absence of indicators. The colors of the examined soils were determined while the soils were moist using the *Munsell Soil Color Charts* (Munsell, 2010).

3.2.4 HYDROLOGY

Wetlands are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include (but are not limited to) visual observation of surface water, high water table, saturation, water marks (nonriverine), sediment deposits (nonriverine), drift deposits (nonriverine), surface soil cracks, inundation visible on aerial imagery, water stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, oxidized rhizospheres along living roots, etc. Secondary indicators of wetland hydrology include water marks (riverine), sediment deposits (riverine), drainage patterns, dry-season water table, crayfish burrows, etc. Observation of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology.

SECTION 4.0

EXISTING CONDITIONS

The approximate 6.87-acre Study Area is located on east side of Casa Grande Road within Petaluma, CA, in the Napa-Sonoma-Russian River Valleys subregion of the Central California Foothills and Coastal Mountains ecoregion. This area has a warm-summer Mediterranean climate, characterized by mildly hot and dry summers with cool nights and mild to chilly wet winters. Average highs peak in July at 82 degrees Fahrenheit (°F), and January experiences average lows of 39° F (U.S. Climate Data, 2020). Precipitation in the area averages approximately 25.6 inches per year with a majority of the of the rain fall occurring from November through the end of March (NRCS, 2020c). Cover types and vegetative communities within the Study Area are composed of developed/disturbed areas containing two homes, landscaping and a gravel driveway, annual grassland habitat that is pasture for grazing sheep and routinely maintained, riparian woodland habitat. The riverine habitat of Adobe Creek, an intermittent stream with riverine habitat, occurs along the eastern boundary of the Study Area and is a permanent aquatic feature. Two seasonally ponding shallow depressions within the pasture occasionally display standing water were also documented in 2023 and are further discussed in the aquatic resources section below.

4.1 LANDSCAPE SETTING

Two parcels, Assessor's Parcel Numbers (APN) 017-040-016 and 017-040-051, comprising 5.2-acres and an added 1.67-acres owned by the City of Petaluma, total the approximately 6.87-acres (Study Area). The Study Area contains two rural residences with the remainder of the site fenced for rangeland with sheep actively grazing at the time of the surveys. The Study Area is located within the Adobe Creek watershed, a subunit of the San Pablo Bay watershed [USGS hydrologic unit code 18050002] (USGS, 2020). San Pablo Bay is approximately 10.5 miles southeast of the Study Area. The Study Area slopes east towards Adobe Creek occurring along the eastern boundary of the site. Adobe Creek is a USGS blue line stream that generally flows in the south direction where is confluences with the Petaluma River which continues to meander in the south direction, thence San Pablo Bay, thence San Francisco Bay, thence the Pacific Ocean.

4.1.1 SOIL TYPES

Mapped soil types on the Study Area were determined using a Custom Soil Resource Report from the NRCS Web Soil survey and are shown in Figure 4 of **Appendix B** (NRCS, 2020a). One NRCS soil unit was identified within the Study Area which has a map unit name of "Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes, MLRA 14." This soil type has a map unit symbol of CeA. Clear Lake clay is basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock. This soil type occurs within basin floors and is poorly drained with more than 80 inches to a restrictive layer. This soil type has a high frequency of ponding and has a hydric soil rating.

4.1.2 TERRESTRIAL HABITATS

Primary terrestrial habitats or cover types in the Study Area include developed/disturbed, annual grassland, and riparian. Dominant characteristics in each habitat community are discussed below. A habitat map is illustrated in Figure 6 of **Appendix A** and representative photographs are shown in **Appendix B**. A list of vascular plant species observed within the Study Area during surveys is included as

Appendix C. No special-status plants were observed during surveys.

Developed/Disturbed

Approximately 1.29 acres of the Study Area consists of disturbed habitat (photos 1 and 2 of **Appendix C**). The majority of this habitat consists of gravel driveways and parking, residential building and out buildings, and associated maintained lawns and ornamental vegetation.

Annual Grassland

Approximately 4.24 acres of the Study Area consists of non-native annual grassland (photo 3 of **Appendix C**). This habitat consists primarily of non-native grasses and forbs consistent with forage crops for grazing animals. The current property owner raises sheep on the property and were actively grazing this habitat type at the time of the site visits. Dominant grass and forb species observed within this grassland habitat consist of wild oat (*Avena fatua*), short podded mustard (*Hirschfeldia incana*), common fiddleneck (*Amsinckia intermedia*), spring vetch (*Vicia sativa*), and prickly lettuce (*Lactuca serriola*).

Riparian

Approximately 1.12 acres of the Study Area consist of riparian habitat occurring along Adobe Creek along the eastern boundary of the Study Area (photos 4 and 5 of **Appendix C**) and has a relatively dense canopy. Dominant plant species observed within this riparian habitat includes Himalayan blackberry (*Rubus armeniacus*), red willow (*Salix laevigata*), California buckeye (*Aesculus californica*), big leaf maple (*Acer macrophyllum*), fennel (*Foeniculum vulgare*), and flat top sedge (*Cyperus eragrostis*).

4.2 AQUATIC RESOURCES

The Aquatic Resource Delineation Map of the Study Area is included as **Appendix E**. The USFWS NWI (USFWS, 2023a), California Aquatic Resource Inventory (CARI; SFEI 2023), and USGS National Hydrological Dataset (USGS, 2023) were referenced to identify known or previously mapped wetlands or other water features within the Study Area. **Table 3** summarizes NWI aquatic features in the vicinity of the Study Area. Additional NWI Information is shown in Figure 5 of **Appendix A**.

TABLE 3 USFWS NWI FEATURES

Map Symbol	Description	Location
R3UBH	Riverine, upper perennial, unconsolidated bottom, permanently flooded	Occurs within the southeastern portion of the Study Area.
SOURCE: USFWS 2023		

4.2.1 SEASONAL WETLANDS

Two shallow depressions located within the annual grassland were observed with seasonally ponding surface water during the 2023 growing season. A Montrose biologist conducted a follow-up field investigation on May 17, 2023 that focused on the two previously identified ponded areas and also investigated other areas that showed saturated conditions during the growing season for any indicators of seasonal wetlands. Two sample data points were taken at the observed depressions that had surface water ponding as shown in the Aquatic Resources Map (**Appendix D**).

Data collected at the sampling points included the three wetland parameter criteria, as described in the USACE Arid West Regional Guide (USACE, 2008). Soil pits were excavated and assessed for hydric soils. Datasheets for the sample points of the depression features are included in **Appendix F**. The two

depressional features within the Study Area contained hydrophytic vegetation and wetland hydrology indicators, but did not have hydric soils.

4.2.2 OTHER WATERS OF THE U.S.

One intermittent creek (Adobe Creek) was identified within the Study Area. A total of 620 linear feet of the creek's centerline and 0.22 acres of creek area have been classified. Adobe Creek has a Cowardin classification of R4SB3. A summary of the portion of Adobe Creek that occurs within the Study Area is shown in **Table 4**.

TABLE 4 OTHER WATERS OF U.S. IN STUDY AREA

Aquatic Resource Name	Aquatic Resource Classification			
	Cowardin	Location (Lat/Long)	Linear Feet	Acres
Adobe Creek	R4SB3	38.240967°/-122.595642°	620.58	0.22
Total			620.58	0.22

Adobe Creek

Adobe Creek drains the Sonoma Mountain Watershed and flows south to where it confluences with the Petaluma River, thence the San Pablo Bay, thence the San Francisco Bay and thence the Pacific Ocean. Adobe Creek is a second order stream and mapped as a blue line stream according to the USGS National Hydrography Dataset (NHD; USGS 2023). The USFWS NWI map identifies Adobe Creek as a riverine system as shown in Figure 5 of **Appendix A** (USFWS, 2023c). The NWI classification further depicts the riverine system as an intermittent subsystem of streambed class having a seasonally-flooded water regime. The creek displays a clear OHWM, top of bank, and therefore is likely be considered a Water of the U.S. and State of California subject to USACE and RWQCB jurisdiction, respectively.

Approximately 620 linear feet and 0.22 acres of Adobe creek flow within the Study Area. This feature enters the Study Area at the northeast corner, flowing along the eastern boundary, and exits at the southeast corner of the Study Area (**Appendix D**). The width of the creek averages 25 feet. The substrates vary from cobble to sand bars. The majority of the riverine habitat is covered by tree canopy with more canopy openings in the southern section. Adobe Creek was assessed by the CDFW and determined to provide suitable habitat for anadromous fishes (CDFW, 2008). A representative photo of Adobe Creek is included in Photo 5 of **Appendix B**.

Flowing water was present within the creek channel during the April 15, 2020 survey of the Study Area. During the June 15, 2020 survey of the Study Area, no water was present within the creek. At the time of the 2021 survey water was present within the creek. No emergent vegetation was observed within the portion of creek channel that occurs within the Study Area. Hydrophytic vegetation was observed within areas with favorable soil moisture regimes along elevational gradients of the creek banks. Dominant woody species of the riparian vegetation is composed of red willows (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), California buckeye (*Aesculus californica*), big leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), and other riparian vegetation were observed growing outside of the channel and hanging over the water's edge (Photo 5 of **Attachment A**). The OHWM within the Study Area was determined by evidence of water staining on cobble, undercut banks, and abrupt change of vegetation along the bank of the creek. Additionally, upstream and downstream of the Study Area, there was evidence of shelving, drift deposits, and a change in particle size which further helped establish an understanding of the location of the OHWM.

SECTION 5.0

CONCLUSION

Montrose biologists conducted field studies to support an aquatic resources delineation of the approximate 6.78-acre Study Area on April 15, 2020, June 15, 2020, November 24, 2021, and May 17, 2023. In total, three aquatic features were observed within the Study Area. Adobe Creek and two shallow depressions were observed with seasonally ponding water after a series of significant precipitation events during the 2023 rainy season. Field investigations focused on these features, determined they lacked hydric soils and therefore did not display all three wetland parameters. The two depressional features are likely not jurisdictional wetlands.

The aquatic feature identified within the Study Area is Adobe Creek, totaling approximately 620 linear feet and 0.22 acres. The section of Adobe Creek within the Study area was surveyed and mapped and the resource classifications are summarized below in **Table 5** and shown in Aquatic Resources Map (**Appendix D**).

TABLE 5 AQUATIC RESOURCE CLASSIFICATION SUMMARY

Aquatic Resource Classification						
Category	Feature Name	Cowardin	Location (Lat/Long)	Acres	Linear Feet	Contiguity
Other Waters	Adobe Creek	R4SB3	38.240967°/-122.595642°	0.22	620.58	Yes
TOTAL				0.22	620.58	Yes

SECTION 6.0

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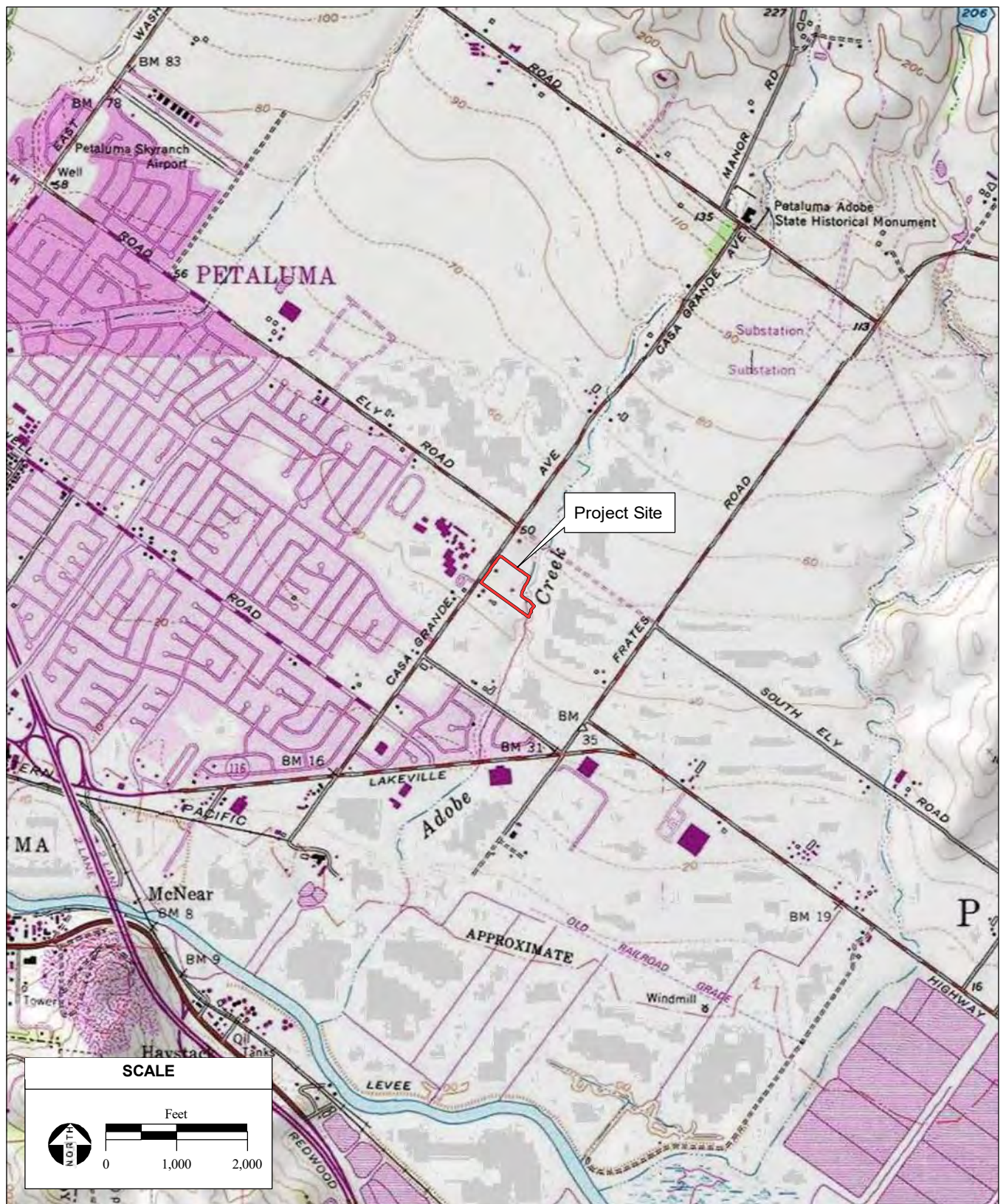
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APPENDICES

APPENDIX A

SUPPORT MAP FIGURES





SOURCE: "Petaluma River, CA" USGS 7.5 Minute Topographic Quadrangle, T4N R7W, Unsectioned Area of Petaluma River, Mt. Diablo Baseline & Meridian; ESRI, 2020; AES-Montrose, 12/19/2023

Creekwood Housing Development Project Aquatic Resources Delineation / 220517

Appendix A - Figure 2
Site and Vicinity



SOURCE: Sonoma County aerial photograph, 2/20/2021;
ESRI, 2020; AES-Montrose, 12/19/2023

Creekwood Housing Development Project Aquatic Resources Delineation / 220517

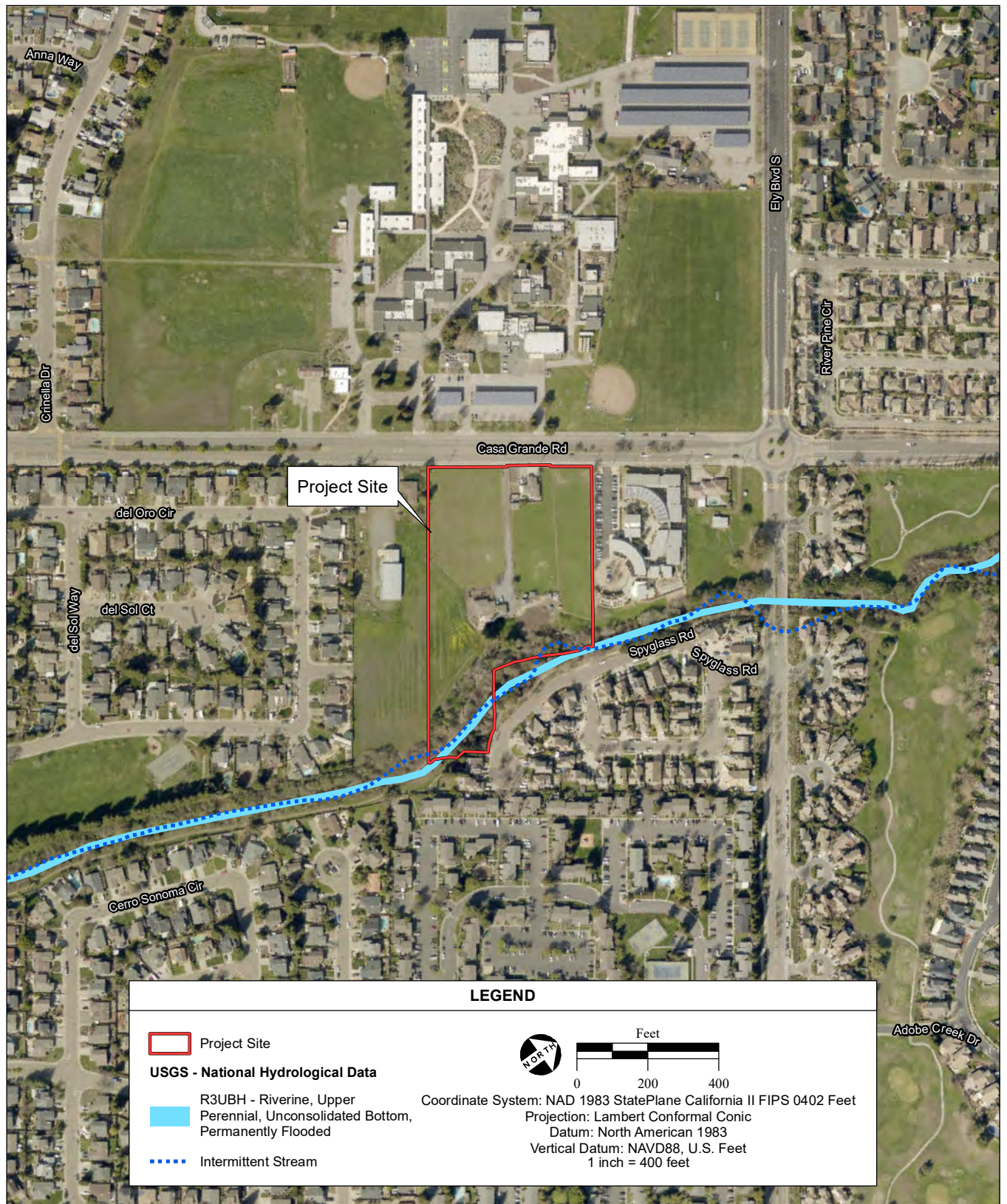
Appendix A - Figure 3
Aerial Photograph



SOURCE: USDA NRCS Soil Survey of Sonoma County, version 15
 updated September 29, 2021; Sonoma County aerial photograph, 2/20/2021;
 ESRI, 2022; AES-Montrose, 12/19/2023

Creekwood Housing Development Project Aquatic Resources Delineation / 220517

Appendix A - Figure 4
 Soil Types



SOURCE: USFWS National Wetlands Inventory, "Santa Rosa NE, CA"
 100k Topographics Quadrangle Survey, 1976; Sonoma County
 aerial photograph, 2/20/2021; ESRI, 2022; AES-Montrose, 1/3/2024

Creekwood Housing Development Project Aquatic Resources Delineation / 220517 ■

Appendix A - Figure 5

Aquatic Resources Geo-spatial Databases



SOURCE: Sonoma County aerial photograph, 2/20/2021;
ESRI, 2020; AES-Montrose, 12/19/2023

Creekwood Housing Development Project Aquatic Resources Delineation / 220517

Appendix A - Figure 6
Habitat Types

APPENDIX B

SITE PHOTOGRAPHS



PHOTO 1: Showing a residence occurring within the northern portion of the Study Area, facing northwest towards Casa Grande Road.



PHOTO 3: A representative view of the annual grassland habitat occurring within the Study Area, facing northwest towards Casa Grande Road.



PHOTO 5: Showing the dense riparian habitat along Adobe Creek.



PHOTO 2: Showing a second residence occurring within the southern portion of the Study Area, facing south.



PHOTO 4: Riparian habitat along the eastern boundary of the Study Area.

APPENDIX C

LIST OF PLANT SPECIES OBSERVED

Plant Species Found Within the Study Area

Scientific Name	Common Name	WIS
<i>Acer negundo</i>	boxelder	FACW
<i>Acer macrophyllum</i>	big leaf maple	FAC
<i>Aesculus californicum</i>	California buckeye	N/A
<i>Agrostis exarata</i> *	spike bentgrass	FACW
<i>Alisma triviale</i>	water plantain	OBL
<i>Amsinckia intermedia</i>	Common fiddleneck	N/A
<i>Artemisia douglasiana</i>	California mugwort	FAC
<i>Capsella bursa-pastoris</i> *	shepherd's purse	FACU
<i>Cirsium vulgare</i> *	bull thistle	FACU
<i>Conium maculatum</i> *	poison hemlock	FACW
<i>Convolvulus arvensis</i> *	field bindweed	N/A
<i>Cornus sericea</i>	dogwood	N/A
<i>Crataegus monogyna</i> *	hawthorn	FAC
<i>Cyperus eragrostis</i>	tall cyperus	FACW
<i>Dactylis glomerata</i> *	orchard grass	FACU
<i>Dysphania ambrosioides</i> *	Mexican tea	FAC
<i>Baccharis pilularis</i>	coyote bush	N/A
<i>Epilobium ciliatum</i>	slender willow herb	FACW
<i>Festuca perennis</i> *	Italian rye grass	FAC
<i>Fraxinus latifolia</i>	Oregon ash	FACW
<i>Foeniculum vulgare</i> *	fennel	N/A
<i>Hedera helix</i> *	English ivy	FACU
<i>Helminthotheca echioides</i>	Bristly ox-tongue	FACU
<i>Hirschfeldia incana</i> *	short podded mustard	N/A
<i>Lactuca serriola</i> *	prickly lettuce	FACU
<i>Lathyrus sp.</i>	pea	N/A
<i>Lepidium latifolium</i> *	perennial pepperweed	FAC
<i>Lotus corniculatus</i> *	Bird's foot trefoil	FAC
<i>Juncus bufonius</i>	toad rush	FACW
<i>Medicago polymorpha</i> *	bur clover	FACU
<i>Mentha pulegium</i> *	pennyroyal	OBL
<i>Nasturtium officinale</i>	watercress	OBL
<i>Phalaris aquatic</i> *	harding grass	FACU
<i>Quercus agrifolia</i>	coast live oak	N/A
<i>Quercus lobata</i>	valley oak	FACU
<i>Ranunculus sp.</i>	buttercup	N/A
<i>Umbellularia californica</i>	California bay	FAC
<i>Rorippa curvisiliqua</i>	curve-pod yellowcress	OBL
<i>Rubus armeniacus</i> *	Himalayan blackberry	FAC
<i>Rubus ursinus</i>	California blackberry	FAC
<i>Rumex conglomeratus</i>	clustered dock	FACW
<i>Salix laevigata</i>	red willow	FACW
<i>Salix lasiolepis</i>	arroyo willow	FACW
<i>Sequoia sempervirens</i>	coast redwood	N/A
<i>Sonchus oleraceus</i> *	sow thistle	UPL
<i>Stachys ajugoides</i>	Ajuga hedge nettle	OBL
<i>Veronica persica</i> *	birdeye speedwell	N/A
<i>Vicia sativa</i> *	Spring vetch	FACU
<i>Xanthium spinosum</i> *	spiny cocklebur	FACU

* = Non-native

Wetland Indicator Status (WIS)

OBL	=	Occurs in aquatic resources >99% of time
FACW	=	Occurs in aquatic resources 67-99% of time
FACU	=	Occurs in aquatic resources 34-66% of time
UPL	=	Occurs in aquatic resources 1-33% of time
NI	=	Indicator status not known in this region

APPENDIX D

AQUATIC RESOURCES DELINEATION MAP



SOURCE: Vivid Maxar aerial photograph, 3/26/2021; ESRI, 2022;
AES, 1/3/2024

Creekwood Housing Development Project Aquatic Resources Delineation / 220517

Appendix D

Aquatic Resources Delineation Map

APPENDIX E

AQUATIC RESOURCES EXCEL SHEET

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Adobe Creek	CALIFORNIA	R4SB	RIVERINE	Linear	620.5	FOOT	A1	38.240967°	-122.595642°	Adobe Creek
Sim_Situated Sim_Situated_Aggregated_SPE Adjcent_Waters_Subjct_33USC1344 OHWM_Chg_In_Plant_Community OHWM_Bed_And_Banks OHWM_Chg_In_Slope OHWM_Chg_In_Character_Of_Soil OHWM_Chg_In_Veg_Densy_Maturity OHWM_Line_Impressed_On_Bank OHWM_Destr_Of_Terrestrial_Veg OHWM_Leaf_Litter_Disturbed OHWM_Multiple_Flow_Events OHWM_Scour OHWM_Sediment_Deposition OHWM_Sediment_Sorting OHWM_Litter_and_Debris_Present OHWM_Wrckc_Line_Present OHWM_Veg_Matted_Bent_Or_Absent OHWM_Water_Staining OHWM_Other_Text Func_I_Sediment_Trapping Func_II_Nutrient_Recycling Func_III_Pollutant_Management Func_IV_Retnnt_Attenu_Fld_Wtrs Func_V_Runoff_Storage Func_VI_Contribution_of_Flow Func_VII_Export_Organic_Matter Func_VIII_Export_Food_Rsources Func_IX_Prov_Life_Cycle_Depdnt										

APPENDIX F

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Creekwood Housing Development Project City/County: City of Petaluma/Sonoma Co. Sampling Date: 2023/05/17
 Applicant/Owner: Falcon Point Associates, LLC State: CA Sampling Point: 1U
 Investigator(s): Cedrick Villasenor Section, Township, Range: Section 00, Township 5 North, Range 7 West
 Landform (hillslope, terrace, etc.): terrace (Adobe Creek) Local relief (concave, convex, none): convex Slope (%): < 2%
 Subregion (LRR): C (MLRA 15) Lat: 38.240712° Long: -122.596431° Datum: WGS 84
 Soil Map Unit Name: Clearlake Clay (CeA) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Hydic Soil Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☒ No ☐		
Remarks: No hydric soils present.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>20 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>N/A</u>				
2. _____				
3. _____				
4. _____				
				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
= Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10 ft</u>)				
1. <u>N/A</u>				
2. _____				
3. _____				
4. _____				
5. _____				
= Total Cover				Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Lythrum hyssopifolium</u>	<u>65</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Hordeum marinum</u>	<u>10</u>		<u>FAC</u>	
3. <u>Phalaris paradoxa</u>	<u>5</u>		<u>FAC</u>	
4. <u>Crypsis schoenoides</u>	<u>2</u>		<u>FACW</u>	
5. <u>Hirschfeldia incana</u>	<u>1</u>		<u>N/A</u>	
6. <u>Helminthotheca echioides</u>	<u>1</u>		<u>FAC</u>	
7. _____				
8. _____				
= Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: <u>10 ft</u>)				
1. <u>N/A</u>				
2. _____				
= Total Cover				
% Bare Ground in Herb Stratum <u>10</u> % Cover of Biotic Crust <u>30</u>				Hydrophytic Vegetation Present? Yes ☒ No ☐
Remarks:				

SOIL

Sampling Point: 1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	2.5 YR 3/1	100	-	-	-	-	Clay	Extensive roots present
9-27	5 Y 2.5/1	100	-	-	-	-	Clay	Moderate amount of roots

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|---|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Stratified Layers (A5) (LRR C) | ☐ Depleted Matrix (F3) |
| ☐ 1 cm Muck (A9) (LRR D) | ☐ Redox Dark Surface (F6) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Depressions (F8) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Vernal Pools (F9) |
| ☐ Sandy Gleyed Matrix (S4) | |

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)

- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____

Water Table Present? Yes _____ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Creekwood Housing Development Project City/County: City of Petaluma/Sonoma Co. Sampling Date: 2023/05/17
 Applicant/Owner: Falcon Point Associates, LLC State: CA Sampling Point: 2U
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 Subregion (LRR): C (MLRA 15) Lat: 38.240883° Long: -122.596594° Datum: WGS 84
 Soil Map Unit Name: Clearlake Clay (CeA) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Hydic Soil Present? Yes ☐ No ☒	Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Remarks: No hydric soils present.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>20 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>N/A</u>				
2. _____				
3. _____				
4. _____				
				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
= Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10 ft</u>)				
1. <u>N/A</u>				
2. _____				
3. _____				
4. _____				
5. _____				
				Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
= Total Cover				
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Hordeum marinum</u>	<u>45</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Lolium perenne</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Plagiobothrys bracteatus</u>	<u>5</u>		<u>FACW</u>	
4. <u>Crypsis schoenoides</u>	<u>2</u>		<u>FACW</u>	
5. <u>Phalaris paradoxa</u>	<u>2</u>		<u>FAC</u>	
6. <u>Convolvulus arvensis</u>	<u>2</u>		<u>FAC</u>	
7. <u>Rumex acetosella</u>	<u>2</u>		<u>FACU</u>	
8. <u>Avena barbata</u>	<u>2</u>		<u>N/A</u>	
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes ☒ No ☐
= Total Cover				
Woody Vine Stratum (Plot size: <u>10 ft</u>)				
1. <u>N/A</u>				
2. _____				
% Bare Ground in Herb Stratum <u>15</u> % Cover of Biotic Crust <u>25</u>				

Remarks:

SOIL

Sampling Point: 2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 3/1	100	-	-	-	-	Clay	
1-24	5 YR 2.5/1	100	-	-	-	-	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|---|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Stratified Layers (A5) (LRR C) | ☐ Depleted Matrix (F3) |
| ☐ 1 cm Muck (A9) (LRR D) | ☐ Redox Dark Surface (F6) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Depressions (F8) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Vernal Pools (F9) |
| ☐ Sandy Gleyed Matrix (S4) | |

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)

- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____

Water Table Present? Yes _____ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX G

SIGNED STATEMENT FROM PROPERTY OWNER ALLOWING ACCESS

REQUEST FOR AQUATIC RESOURCES DELINEATION VERIFICATION

OR JURISDICTIONAL DETERMINATION

A separate jurisdictional determination (JD) is not necessary to process a permit. An Approved Jurisdictional Determination (AJD) is required to definitively determine the extent of waters of the U.S. and is generally used to disclaim jurisdiction over aquatic resources that are not waters of the U.S., in cases where the review area contains no aquatic resources, and in cases when the recipient wishes to challenge the water of the U.S. determination on appeal. Either an Aquatic Resources Delineation Verification or a Preliminary Jurisdictional Determination (PJD) may be used when the recipient wishes to assume that aquatic resources are waters of the U.S. for the purposes of permitting. In some circumstances an AJD may require more information, a greater level of effort, and more time to produce. If you are unsure which product to request, please speak with your project manager or call the Sacramento District's general information line at (916) 557-5250.

I am requesting the product indicated below from the U.S. Army Corps of Engineers, Sacramento District, for the review area located at:

Street Address: <u>256 and 280 Casa Grande</u> City: <u>Petaluma</u> County: <u>Sonoma</u>	
State: <u>CA</u> Zip: <u>94954</u> Section: <u>Unsectioned</u> Township: <u>T4N</u> Range: <u>R7W</u>	
Latitude (decimal degrees): <u>38.241494°</u> Longitude (decimal degrees): <u>-122.833558°</u>	
The approximate size of the review area for the JD is <u>5.2</u> acres. (Please attach location map)	
Choose one: ☐ I own the review area ☐ I hold an easement or development rights over the review area ☐ I lease the review area ☒ I plan to purchase the review area ☐ I am an agent/consultant acting on behalf of the requestor ☐ Other: _____	Choose one product: ☐ I am requesting an Aquatic Resources Delineation Verification ☐ I am requesting an Approved JD ☒ I am requesting a Preliminary JD ☐ I am requesting additional information to inform my decision about which product to request
Reason for request: (check all that apply) ☐ I need information concerning aquatic resources within the review area for planning purposes. ☒ I intend to construct/develop a project or perform activities in this review area which would be designed to avoid all aquatic resources. ☐ I intend to construct/develop a project or perform activities in this review area which would be designed to avoid those aquatic resources determined to be waters of the U.S. ☐ I intend to construct/develop a project or perform activities in this review area which may require authorization from the Corps; this request is accompanied by my permit application. ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district's list of navigable waters under Section 10 of the Rivers and Harbors Act of 1899 and/or is subject to the ebb and flow of the tide. ☐ My lender, insurer, investors, local unit of government, etc. has indicated that an aquatic resources delineation verification is inadequate and is requiring a jurisdictional determination. ☐ I intend to contest jurisdiction over particular aquatic resources and request the Corps confirm that these aquatic resources are or are not waters of the U.S. ☐ I believe that the review area may be comprised entirely of dry land. ☐ Other: _____	
Attached Information: ☒ Maps depicting the general location and aquatic resources within the review area consistent with Map and Drawing Standards for the South Pacific Division Regulatory Program (Public Notice February 2016, http://www.spd.usace.army.mil/Missions/Regulatory/Public-Notices-and-References/Article/651327/updated-map-and-drawing-standards/) ☒ Aquatic Resources Delineation Report, if available, consistent with the Sacramento District's Minimum Standards for Acceptance (Public Notice January 2016, http://1.usa.gov/1V68IYa)	
By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the review area. Your signature shall be an affirmation that you possess the requisite property rights for this request on the subject property.	
*Signature: _____ Date: _____	
Name: <u>Doyle Heaton</u> Company name: <u>Falcon Point Associates, LLC</u>	
Address: <u>3496 Buskirk Ave, Suite 104</u>	
<u>Pleasant Hill, CA, 94523</u>	
Telephone: <u>(925) 939-3473</u> Email: <u>doyle@drbuilders.com</u>	

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

APPENDIX G

BOTANICAL SURVEY TECHNICAL MEMORANDUM

TECHNICAL MEMORANDUM

TO:	Falcon Point Associates, Inc.
FROM:	Kathleen Sholty, Senior Project Manager
SUBJECT:	Creekwood Development Project – 2021 Botanical Surveys
DATE:	4/15/2022

On behalf of Falcon Point Associates, Inc., Montrose Environmental Solutions (MES) has prepared this technical memo to document the results of focused botanical surveys conducted for the Creekwood Housing Development Project (Project). The Project is located at 256 and 280 Casa Grande Road, in the City of Petaluma, California (Property). Per the recommendations included in the Biological Resource Assessment for the Project (MES, 2022), yearly botanical surveys are to be conducted during the identifiable bloom period for special-status species until the Project starts construction.

The 2022 BRA evaluated the site for the potential of special-status plant species to occur within the Property. Database searches for the surrounding areas were used to determine that there are 17 plant species that could occur regionally. Of these 17 special-status plant species, 2 were determined to have a possibility to occur within the Project Site based on site-specific results of habitats observed during previous biological surveys conducted at the Property on April 15, 2020 and June 15, 2020. No special-status plant species were documented during those two surveys.

On April 29, 2021, Montrose Environmental Solutions (MES) botanist Cedrick Villaseñor conducted a follow-up focused botanical survey. The survey was conducted during the blooming period of the two special-status plants with the potential to occur within the Project Site. The congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*) are in bloom and identifiable between April through November. The second species, the Pacific Grove clover (*Trifolium polyodon*), is in bloom and identifiable between April and June. No special-status plant species were observed during the April 29th focused botanical survey; therefore, no further action is necessary.